BUTTERS ROW CONSTRUCTION BASELINE DATA							
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	ENDING STATION	NORTHING	EASTING
L4	52+85.63	3021420.0995	746432.0792		54+87.91	3021584.0154	746550.5973
C-4	54+87.91	3021584.0154	746550.5973	R=200.00' Δ=30°50'01" L=107.63' T=55.15'	55+95.54	3021683.6478	746587.7528
L5	55+95.54	3021683.6478	746587.7528		56+56.92	3021744.7904	746593.1397
C-5	56+56.92	3021744.7904	746593.1397	R=200.00' Δ=40°05'58" L=139.97' T=72.99'	57+96.89	3021868.9905	746651.2791

CROSS STREET CONSTRUCTION BASELINE DATA							
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	ENDING STATION	NORTHING	EASTING
L6	40+00.00	3021870.5509	746652.8468		40+20.12	3021884.7415	746667.1043
C-6	40+20.12	3021884.7415	746667.1043	R=100.00' Δ=47°30'07" L=82.91' T=44.00'	41+03.02	3021959.7486	746696.4746
C-7	41+03.02	3021959.7486	746696.4746	R=200.00' Δ=14°46'58" L=51.60' T=25.95'	41+54.62	3022011.0099	746700.9811
L7	41+54.62	3022011.0099	746700.9811		43+23.68	3022176.1091	746737.3278

WILMINGTON
BUTTERS ROW OVER MBTA

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	13	105
PROJECT FILE NO.	608929		

CURB TIE & GRADING PLANS - 2

LIMIT OF WORK
STA 240+06.54
N 3021978.5094
E 746545.4280

241+58.84 MAIN STREET (ROUTE 38)=
57+99.10 BUTTERS ROW

MAIN STREET (ROUTE 38)
(PUBLIC - 1910 STATE HIGHWAY LAYOUT)

BUTTERS ROW
(1894 TOWN LAYOUT - VARIABLE WIDTH)

CROSS STREET
(1894 TOWN LAYOUT - VARIABLE WIDTH)

241+58.84 MAIN STREET (ROUTE 38)=
40+00.00 CROSS STREET

END PROJECT
PROJECT NO. 608929
END PAVEMENT FINE MILLING AND RESURFACING
STA 41+95.00
N 3022050.4413
E 746709.6620

END FULL DEPTH PAVEMENT
BEGIN PAVEMENT FINE MILLING AND RESURFACING
STA 41+65.74
N 3022021.8826
E 746703.2874

LIMIT OF WORK
STA 243+14.73
N 3021761.2772
E 746764.0191

635 MAIN STREET OWNER LLC
PARCEL ID 40-1
BOOK 34786 PAGE 182
635 MAIN ST

ANDREA J. DELUCA
PARCEL ID 39-16
BOOK 18231 PAGE 111
665 MAIN ST

N/F
ONE CROSS LLC
PARCEL ID 40-11
BOOK 35186 PAGE 80

TOWN OF WILMINGTON
PARCEL ID 40-13-A
BOOK 35162 PAGE 138
CROSS ST

N/F
DIAMOND PROPERTIES TRUST
PARCEL ID 39-6
BOOK 33133 PAGE 123
668 MAIN ST

Curve Table			
CURVE #	DELTA	RADIUS	LENGTH
C22	111°36'28"	40.00	77.92
C23	74°55'11"	60.00	78.46
C24	136°35'41"	40.00	95.36
C25	61°26'44"	30.00	32.17
C26	16°50'06"	100.00	29.38
C27	89°11'58"	5.00	7.78

MAIN STREET (ROUTE 38) CONSTRUCTION BASELINE DATA							
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	ENDING STATION	NORTHING	EASTING
L8	239+50.00	3022018.5909	746505.5469		242+06.25	3021836.9437	746686.2859
C-8	242+06.25	3021836.9437	746686.2859	R=3400.00' Δ=2°25'21" L=143.75' T=71.89'	243+50.00	3021737.2138	746789.8037

SCALE: 1" = 40'

WQC/ACOE PLANS SHEET 12 OF 23

CONTINUED ON SHEET 13

A00840-223

Proposal No. 608929-123406

608929_HD09 (CURB TIE & GRADING PLAN).DWG Plotted on 16-Dec-2022 3:24 PM

WILMINGTON
BUTTERS ROW OVER MBTA

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	14	105
PROJECT FILE NO.	608929		

DRAINAGE AND UTILITY PLANS - 1

Plotted on 13-Mar-2023 5:38 PM

608929_HDXX (DRAINAGE & UTILITY PLANS).DWG

Proposal No. 608929-123406

A00840-234

BEGIN PROJECT
PROJECT NO. 608929
BEGIN PAVEMENT FINE MILLING AND RESURFACING
STA 50+22.00
N 3021223.2821
E 746285.1202

END PAVEMENT FINE MILLING AND RESURFACING
BEGIN FULL DEPTH PAVEMENT
STA 51+00.00

BUTTERS ROW
50+00
(PUBLIC)

BUTTERS ROW CONSTRUCTION 8

N/F
MICHAEL A MONTUORI
PARCEL ID: 28-5E
LCC 37144A
CERT 35971
39 BUTTERS ROW

N/F
DANIEL B. HALLIDAY
& DOROTHY A. HALLIDAY
PARCEL ID: 27-4
BOOK 2006 PAGE 109
28 BUTTERS ROW

PPF INDUSTRIAL 613 MAIN, LLC
PARCEL ID: 29-11S
BOOK 35230 PAGE 258
613 MAIN ST

ANDREA L.R. MAGGIO
PARCEL ID 27-1
BOOK 36240 PAGE 68
26 BUTTERS ROW

N/F
MICHAEL J. SHEEHAN
& CATHERINE H. SHEEHAN
PARCEL ID 27-2
BOOK 7292 PAGE 243
2 FACTORY ST

N/F
MASSACHUSETTS BAY
TRANSPOTATION AUTORITY

635 MAIN STREET OWNER LLC
PARCEL ID 40-1
BOOK 34786 PAGE 182
635 MAIN ST

ANDREA J. DELUCA
PARCEL ID 39-16
BOOK 18231 PAGE 111
665 MAIN ST

N/F
JARID POLLEY AND
MARY DIBENEDETTO
PARCEL ID 39-15
BOOK 36262 PAGE 288
669 MAIN ST

MBTA RAILROAD

PROP CONNECTION TO EXISTING UP LOCATION TO BE DETERMINED
PROP FEE TAKING ON BEHALF OF THE TOWN OF WILMINGTON
PROP TEMP POLE & 20' GUY & 20 'PUSH BRACE (BO)
CONNECT TO EXISTING 12" WATER MAIN WITH 12" MECHANICAL RESTRAINED COUPLING
PROP. 12"-11.25° BEND AND THRUST BLOCK
PROP 20' GUY (BO-KEOLIS)
PROP TEMP POLE & GUY 20' (BO-VERIZON)
REM UP (BO)
RET
PROP. STONE FOR PIPE ENDS
PROP TEMP POLE & 20' GUY (BO)
CONNECT TO EXISTING 12" WATER MAIN WITH 12" MECHANICAL RESTRAINED COUPLING
PROP 20' SIDEWALK DOWN GUY (BO)
PROP PERM EASEMENT
PROP. RELOCATION OF 12"DI RAW WATER
PROP PERM EASEMENT
PROP. CB (1-4)
4 LF - 12" RCP
PROP. DMH (1-5)
PROP TEMP EASEMENT (TYP)
PROP PERM EASEMENT
PROP. FES (1-9)
32 LF - 12" RCP
PROP. DMH (1-3)
28 LF - 12" CLASS V RCP
PROP. CB (1-2)
PROP TEMP POLE (BO)
APPROXIMATE EASEMENT LINE
(SEE PLAN BOOK 198 PLAN 112)
97 LF - 12" CLASS IV RCP
ADJ GG (BO) 52
GG (REC)
24 LF - 12" CLASS IV RCP
R&R UP 15-25 & LUMINAIRE (BO)
PROP. 12" DIP WATER
PROP. CB (1-1)
PROP. TEST PIT
26 LF - 12" RCP
PROP. CB (1-8)
PROP TEMP EASEMENT
RETAIN 30" RCP CULVERT
(2) PROP. 12"-45° BENDS AND THRUST BLOCKS
CUT AND PLUG AND ABANDON EXISTING 12" WATER MAIN
(2) PROP. 12"-45° BENDS AND THRUST BLOCKS
PROP. 12" INSERTION GATE VALVE
SMH RIM=98.98 INV.=69.23(REC)
PROP. SMH (18 FT AND OVER)
RT INTERCEPTOR
30" RC SEWER EASEMENT
20' SEWER EASEMENT (SEE PLAN BOOK W PLAN 728)
RET UP (BO)
RELOCATED PTC CONDUIT (BO)
PROTECT ATT CONDUIT
R&R UP 27 & LUMINAIRE(BO)
PROP TEMP POLE & 20' PUSH BRACE (BO)
PROP. DMH (2-2)
PROP. CB (2-1)
MATCH LINE
R&R UP 26 (BO)
PROP. 12"-45° BEND AND THRUST BLOCK
PROP. SPECIAL SMH (S)
SMH RIM=88.94
17 LF - 12" RCP
BRIDGE NO. W-38-003-(2NV)
RELOCATED PTC CONDUIT
PROP 20' GUY (BO)
RET UP (BO)
R&R UP & 20' GUY (BO)
SMH RIM=87.77
R&D
RMD SMH
PROP. 12"-45° BEND
PROP. 12" MJXMJ EXPANSION COUPLING
INSTALL 2" INSULATION AND ALUM. JACKET ON EXPOSED PIPE ON BRIDGE
REFER TO STRUCTURAL DRAWINGS FOR BRIDGE SUPPORTS AND CASING
PROP. 12" GATE VALVE
PROP. 12"-22.5° BEND AND THRUST BLOCK
PROP. CB (2-3)
6 LF - 12" RCP
R&S POST
PROP UP & 20' GUY (BO)
PROP PERM EASEMENT
20' WATER EASEMENT (SEE PLAN BOOK 198 PLAN 150)
PROP. 12" GATE VALVE
(SEE PROP. 12"-45° BEND AND THRUST BLOCK
REM UP (BO)
PROP. 12"-45° BEND
PROP. AIR RELEASE VALVE
PROP. 12" MJXMJ EXPANSION COUPLING
12" MECHANICALLY RESTRAINED DIP WATER
TELEPHONE PAINT MARK
TELEPHONE PAINT MARK
BRIDGE
100-FOOT WETLAND BUFFER ZONE
PRIVATE LAYOUT LINE
PRIVATE LAYOUT LINE

LEGEND - UTILITIES

- EXIST OVERHEAD WIRE
- PROP OVERHEAD WIRE
- EXIST GAS-OIL-STEAM
- EXIST COMMUNICATION/CATV
- EXIST SEWER (RECORD)
- EXIST SEWER
- PROP SEWER
- EXIST DRAINAGE
- PROP DRAINAGE
- EXIST POTABLE WATER
- PROP POTABLE WATER

0 20 50 100
SCALE: 1" = 40'

CONTINUED ON SHEET NO. 15

WQC/ACOE PLANS SHEET 13 OF 23

WILMINGTON
BUTTERS ROW OVER MBTA

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	15	105
PROJECT FILE NO.		608929	

DRAINAGE AND UTILITY PLANS - 2

CONTINUED ON SHEET NO. 14

LIMIT OF WORK
STA 240+06.54
N 3021978.5094
E 746545.4280

MAIN STREET (ROUTE 38)
(PUBLIC - 1910 STATE HIGHWAY LAYOUT)

CROSS STREET
(1951 COUNTY LAYOUT - 40' WIDE)

BUTTERS ROW

APPROXIMATE LOCATION OF ATT TELEPHONE LINE. SEE UTILITY NOTE 8 FOR MORE INFORMATION

PROP. STONE FOR PIPE ENDS
PROP SEDIMENT CONTROL BARRIER (TYP)
PROP. FES (2-8)
PROP. 5' DIA DMH (2-5)
PROP. CB (2-4)
25 LF - 12" DIP
4 LF - 12" DIP
PROP. CB (2-6)
D.E. DUCT #13 WITH PLUG
73 LF - 12" RCP
108 LF - 12" CLASS V RCP
R&R UP 28 (BO)
MATCH LINE
PROP. OCS (2-1)
BMP1
PROP. 12" DIP WATER
21 LF - 12" RCP
PROP. FES (2-7)
BURY PROP. WATER LINE 3' BELOW THE LOWEST BMP#1 ELEVATION
CUT AND PLUG AND ABANDON EXISTING 12" WATER MAIN
PROP. 12"X6" TEE AND THRUST BLOCK, 6" GATE VALVE, HYDRANT AND 6" DIP
CONNECT TO EXISTING 12" WATER MAIN WITH 12" MECHANICAL RESTRAINED COUPLING
MATCH EXISTING

PROP 20' GUY (BO)
PROP UP & 20' GUY (BO)
PROP PERM EASEMENT
R&R UPL & PROP 20' GUY & LUMINAIRE (BO)
100-FOOT WETLAND BUFFER ZONE
CROSS STREET CONSTRUCTION ℄
BUTTERS ROW CONSTRUCTION ℄
MAIN STREET CONSTRUCTION ℄
RET TMH
R&R ULT 12-74 & PROP 20' GUY & LUMINAIRE (BO)
R&R UP 15-29 & RISER & LUMINAIRE (BO)
PROP PUSH BRACE (BO)
RET

END PROJECT
PROJECT NO. 608929
END PAVEMENT FINE MILLING AND RESURFACING
STA 41+95.00
N 3022050.4413
E 746709.6620

END FULL DEPTH PAVEMENT
BEGIN PAVEMENT FINE MILLING AND RESURFACING
STA 41+65.74
N 3022021.8826
E 746703.2874

LIMIT OF WORK
STA 243+14.73
N 3021761.2772
E 746764.0191

UNABLE TO DETERMINE CONNECTION TO DOWNSTREAM MAIN, UNABLE TO ROD PAST EOI
SMH
RIM=97.24
INV.(A)=87.25
INV.(B)=87.30
SUMP=87.27
2" PVC AT MANHOLE APPEARS TO BE FORCE MAIN TRANSITION TO GRAVITY MAIN, UNABLE TO ROD PIPE TO DESIGNATE
SMH
RIM=88.53
BOLTED SHUT, INACCESSIBLE

635 MAIN STREET OWNER LLC
PARCEL ID 40-1
BOOK 34786 PAGE 182
635 MAIN ST

ANDREA J. DELUCA
PARCEL ID 39-16
BOOK 18231 PAGE 111
665 MAIN ST

ONE CROSS LLC
PARCEL ID 40-11
BOOK 35186 PAGE 80
CROSS ST

TOWN OF WILMINGTON
PARCEL ID 40-13-A
BOOK 35162 PAGE 138
CROSS ST

N/F
DIAMOND PROPERTIES TRUST
PARCEL ID 39-6
BOOK 33133 PAGE 123
668 MAIN ST

WQC/ACOE PLANS SHEET 14 OF 23

0 20 50 100
SCALE: 1" = 40'

DRAINAGE PLAN 1

DRAINAGE STRUCTURE TABLE						
NAME/TYPE	STATION	OFFSET	RIM ELEV.	INV. ELEV. IN	INV. ELEV. OUT	REMARKS
PROP. CB (1-1)	51+65.39	13.3 R	92.06		I=87.10' (PROP. DMH (1-3))	
PROP. CB (1-2)	51+47.42	13.2 L	90.86		I=87.10' (PROP. DMH (1-3))	
PROP. CB (1-4)	52+83.57	15.0 L	98.09		I=92.66' (PROP. DMH (1-5))	
PROP. CB (1-8)	52+85.28	14.8 R	98.25		I=93.50' (PROP. DMH (1-5))	
PROP. CB (2-1)	55+59.71	15.0 L	103.44		I=98.40' (PROP. DMH (2-2))	
PROP. CB (2-3)	55+63.15	15.0 R	103.18		I=98.10' (PROP. DMH (2-2))	
PROP. DMH (1-3)	51+77.20	9.8 L	91.06	I=86.90' (PROP. CB (1-2)) I=86.90' (PROP. CB (1-1)) I=86.90' (PROP. DMH (1-5))	I=86.80' (PROP. FES (1-9))	
PROP. DMH (1-5)	52+75.89	13.5 L	97.57	I=92.56' (PROP. CB (1-4)) I=93.00' (PROP. CB (1-8))	I=92.00' (PROP. DMH (1-3))	
PROP. DMH (2-2)	55+62.17	5.5 R	103.47	I=98.00' (PROP. CB (2-3)) I=98.00' (PROP. CB (2-1))	I=96.00' (PROP. 5' DIA DMH (2-5))	
PROP. FES (1-9)	51+88.08	39.4 L	87.75	I=86.50' (PROP. DMH (1-3))		

DRAINAGE PLAN 2

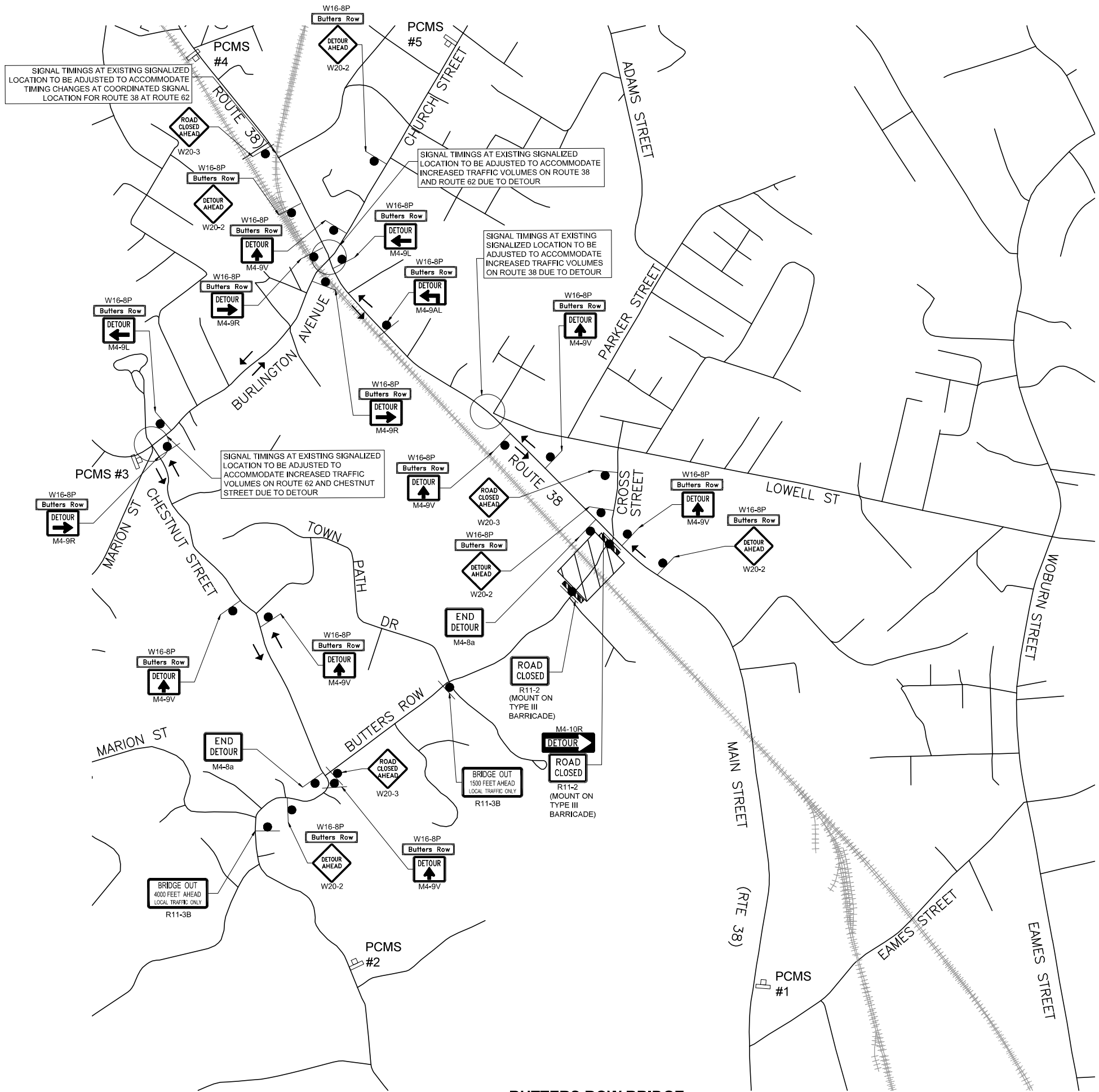
DRAINAGE STRUCTURE TABLE						
NAME/TYPE	STATION	OFFSET	RIM ELEV.	INV. ELEV. IN	INV. ELEV. OUT	REMARKS
PROP. 5' DIA DMH (2-5)	56+74.20	13.5 R	96.39	I=92.60' (PROP. CB (2-4)) I=92.60' (PROP. CB (2-6)) I=93.00' (PROP. DMH (2-2))	I=92.40' (PROP. FES (2-7))	CONCENTRIC CYLINDRICAL STRUCTURE
PROP. CB (2-4)	56+83.84	14.8 L	95.97		I=92.90' (PROP. 5' DIA DMH (2-5))	
PROP. CB (2-6)	56+82.73	15.0 R	96.08		I=92.70' (PROP. 5' DIA DMH (2-5))	
PROP. FES (2-7)	56+71.45	36.4 R	93.45	I=92.20' (PROP. 5' DIA DMH (2-5))		
PROP. FES (2-8)	57+48.91	33.6 L	90.29	I=89.20' (PROP. OCS (2-1))		
PROP. OCS (2-1)	57+39.09	38.7 R	93.47		I=89.75' (PROP. FES (2-8))	

APPROXIMATE NORTH

WILMINGTON
BUTTERS ROW OVER MBTA

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	20	105
PROJECT FILE NO.	608929		

DETOUR PLAN



DETOUR NOTES:

1. THE CONTRACTOR SHALL COORDINATE IMPLEMENTATION OF THIS DETOUR PLAN WITH MASSACHUSETTS DEPARTMENT OF TRANSPORTATION AND TOWN OF WILMINGTON PRIOR TO CONSTRUCTION ACTIVITIES.
2. PLACE ALL SAFETY DEVICES AND CONSTRUCTION SIGNING BEFORE ACTUAL CONSTRUCTION WORK BEGINS. DEPLOY ALL PCMS TWO WEEKS IN ADVANCE OF THE BUTTERS ROW BRIDGE CLOSURE. THE CONTRACTOR SHALL NOTIFY APPLICABLE STATE AND LOCAL AGENCIES TWO (2) WEEKS IN ADVANCE OF PLACING TEMPORARY TRAFFIC CONTROL SIGNS.
3. TEMPORARY CONSTRUCTION SIGNING AND ALL OTHER NECESSARY WORK ZONE TRAFFIC DEVICES SHALL BE REMOVED FROM THE ROADWAY WHEN THEY ARE NOT REQUIRED FOR TRAFFIC CONTROL.
4. THE CONTRACTOR SHALL COORDINATE WITH ANY ABUTTING PROJECTS.
5. EXISTING SIGNS NO LONGER APPLICABLE SHALL BE TEMPORARILY COVERED DURING CONSTRUCTION OR REMOVED AND RESET UPON COMPLETION OF CONSTRUCTION.
6. SIGNS AND SUPPORTS LOCATED ON OR NEAR THE TRAVELED WAY MUST PASS THE CRITERIA SET FORTH IN THE FHWA'S MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).

MESSAGES FOR PCMS #1, PCMS #2

ADVANCE NOTIFICATION		
MESSAGE 1	BUTTERS ROW BRIDGE	
MESSAGE 2	CLOSING DD/MM TO DD/MM	
DURING DETOUR		
MESSAGE 1	BUTTERS ROW CLOSED	
MESSAGE 2	FOLLOW DETOUR AHEAD	

MESSAGES FOR PCMS #3, PCMS #4, PCMS #5

ADVANCE NOTIFICATION		
MESSAGE 1	BUTTERS ROW BRIDGE	
MESSAGE 2	CLOSING DD/MM TO DD/MM	
DURING DETOUR		
MESSAGE 1	BUTTERS ROW CLOSED	
MESSAGE 2	SEEK ALT ROUTE	

LEGEND:

- WORK ZONE
- TYPE III BARRICADE
- TRAFFIC SIGN
- PROPOSED DIRECTION OF TRAFFIC
- PCMS BOARD

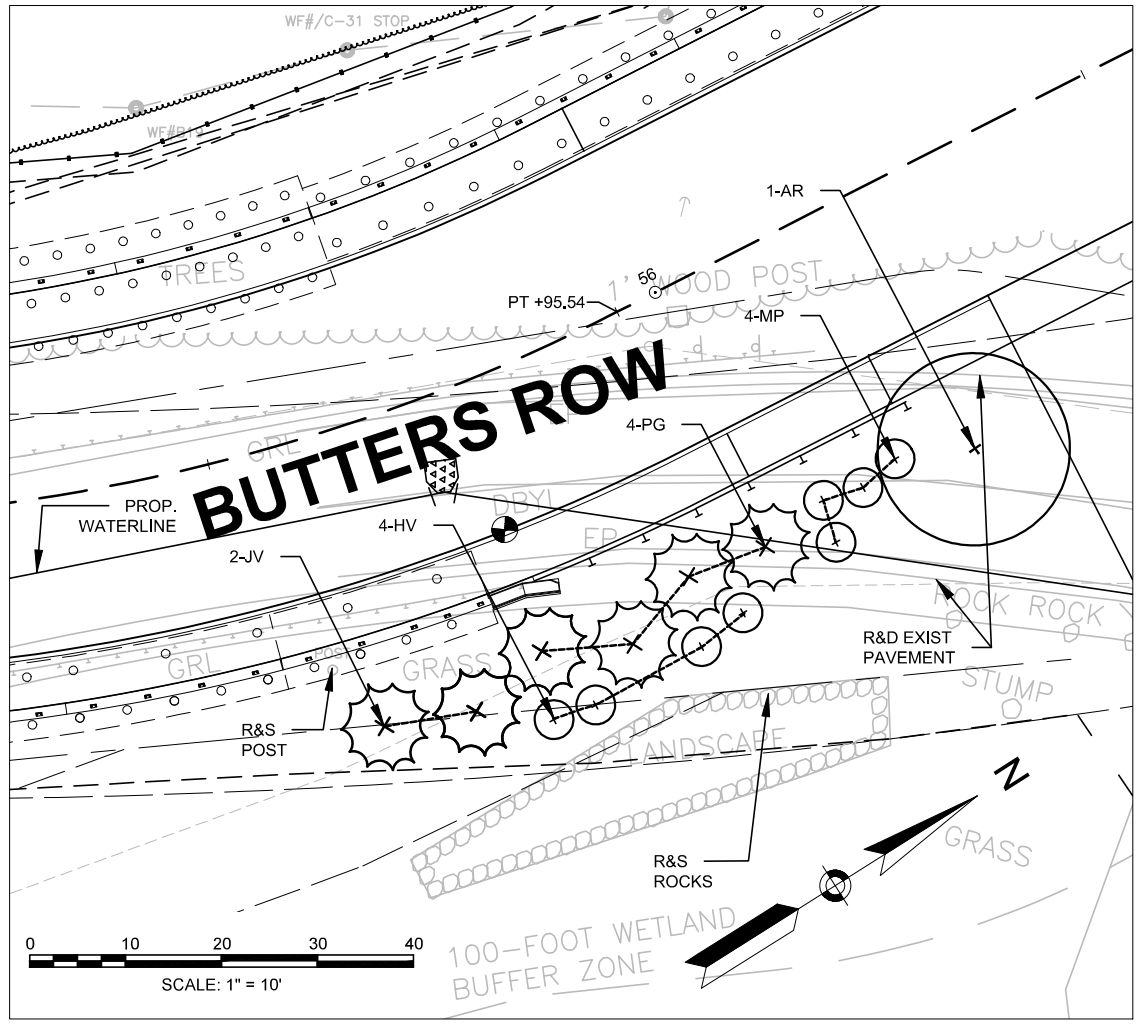
BUTTERS ROW BRIDGE
DETOUR PLAN
SCALE: 1" = 300'

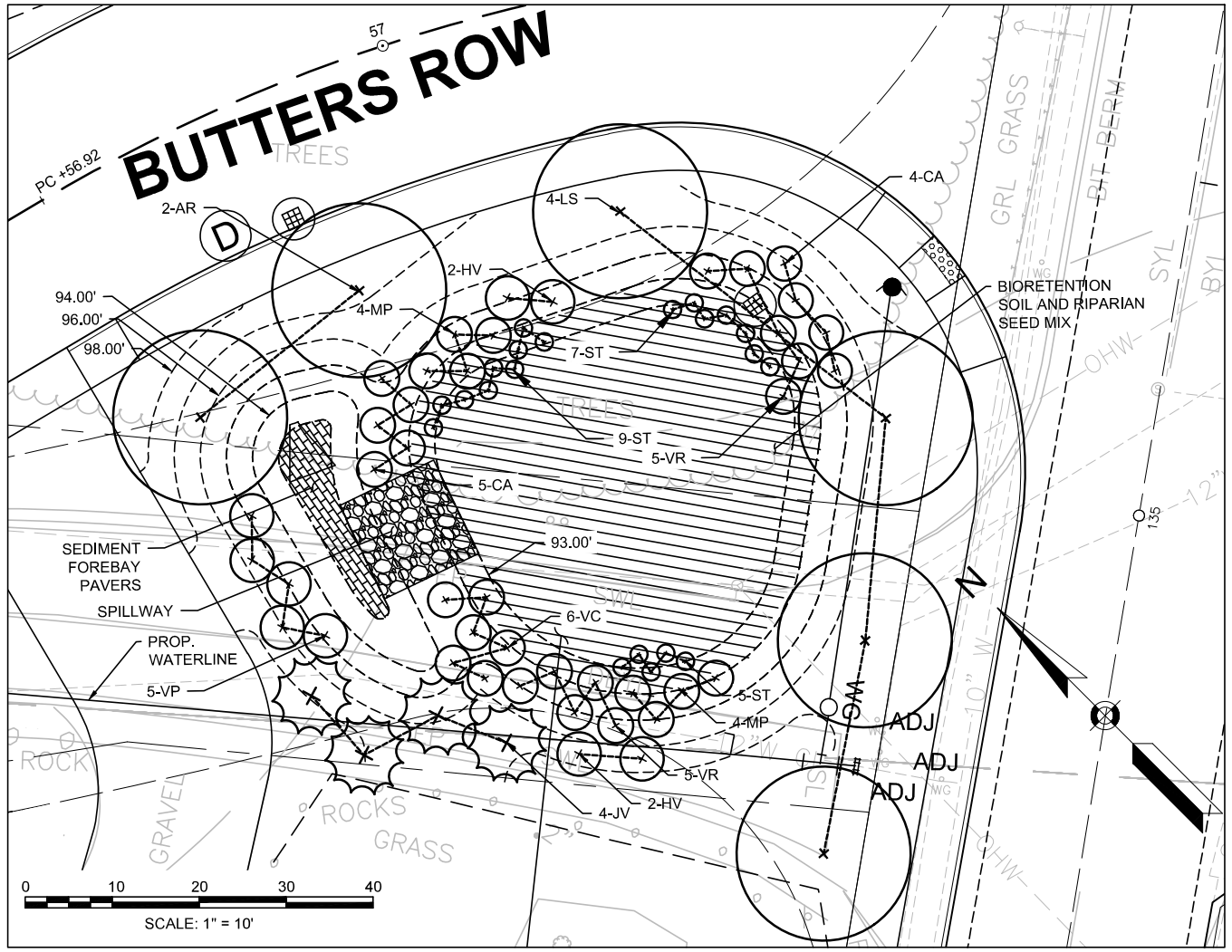
WQC/ACOE PLANS SHEET 16 OF 23

A00840 -237

Proposal No. 608929 123406

608929_HDXX (DETOUR PLAN).DWG Plotted on 16-Dec-2022 3:25 PM





WILMINGTON
BUTTERS ROW OVER MBTA

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	31	105
PROJECT FILE NO.	608929		

LANDSCAPING PLANS

UPLAND BUTTERS ROW PLANTING DESIGN PLAN

PLANT LIST - UPLAND

KEY	QTY	BOTANICAL NAME	COMMON NAME	SIZE	ROOT
		DECIDUOUS TREES			
AR	1	ACER RUBRUM	RED MAPLE	2-2 1/2" CAL	B&B
		EVERGREEN TREES			
JV	2	JUNIPERUS VIRGINIANA	EASTERN RED CEDAR	5-6' HT	B&B
PG	4	PICEA GLAUCA	WHITE SPRUCE	5-6' HT	B&B
		DECIDUOUS SHRUBS			
MP	4	MYRICA PENSYLVANICA	NORTHERN BAY BERRY	2-3 FEET HT	#3 CONT.
HV	4	HAMAMELIS VIRGINIANA	WITCH HAZEL	2-3' HT	#5 CONT.

PLANTING NOTES

1. CONTRACTOR SHALL HAVE ALL SUBSURFACE UTILITIES MARKED PRIOR TO THE START OF WORK.
2. PLANT LOCATIONS ARE APPROXIMATE. PRIOR TO PLANTING, LOCATION OF ALL PLANT MATERIAL WILL BE APPROVED BY THE RESIDENT ENGINEER AND THE LANDSCAPE ARCHITECT.
3. ALL PLANT MATERIAL WILL HAVE TAGS INDICATING COMMON NAME, BOTANICAL NAME, CULTIVAR, & SIZE.
4. IMMEDIATELY AFTER ACCEPTANCE OF PLANTING, TAGS AND RIBBONS SHALL BE REMOVED.
5. ALL PLANTS WILL BE MULCHED PER PLANS AND SPECIFICATIONS.
6. ALL SHRUB AND PERENNIAL BEDS WILL BE WEEDED AND OTHERWISE NEATLY MAINTAINED FOR THE DURATION OF THE CONTRACT.
7. ALL PROPOSED PLANT MATERIAL AND SEED MIXES SHALL BE WATERED AS PER SPECIAL PROVISIONS.

BIORETENTION BASIN AT BUTTERS ROW PLANTING DESIGN PLAN

PLANT LIST - BIORETENTION BASIN

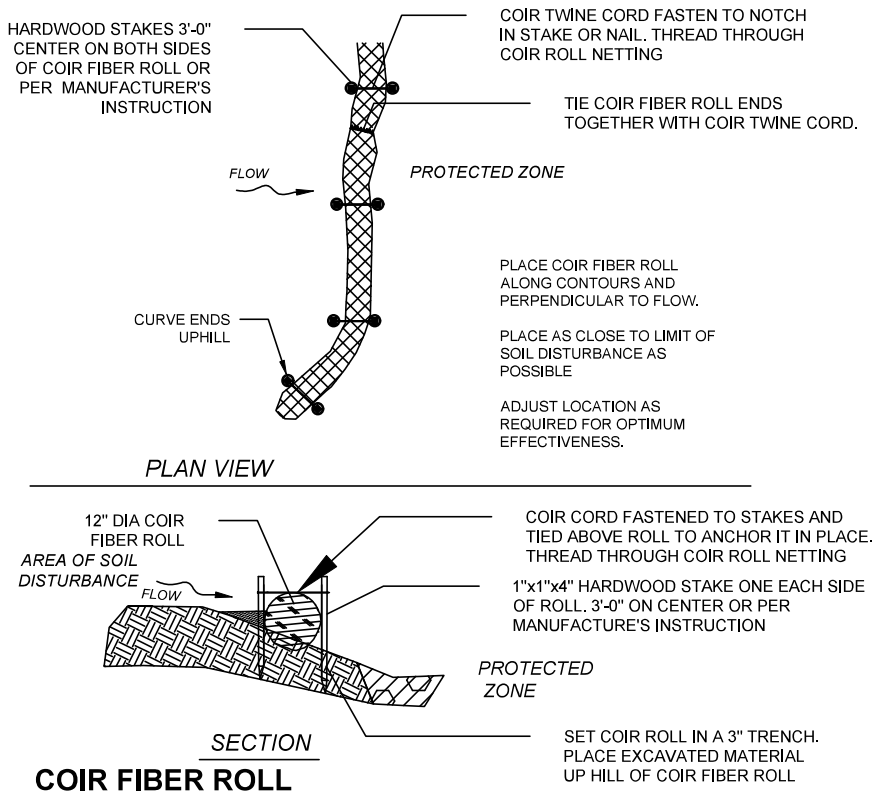
KEY	QTY	BOTANICAL NAME	COMMON NAME	SIZE	ROOT
		DECIDUOUS TREES			
AR	2	ACER RUBRUM	RED MAPLE	2-2 1/2" CAL	B&B
LS	4	LIQUIDAMBAR STYRACIFLUA 'HAPDELL'	HAPPIDAZE FRUITLESS SWEET GUM	2-2 1/2" CAL	B&B
		EVERGREEN TREES			
JV	4	JUNIPERUS VIRGINIANA	EASTERN RED CEDAR	5-6' HT	B&B
		DECIDUOUS SHRUBS			
CA	9	CORNUS SERICEA	REDOSIER DOGWOOD	2-3' HT	#3 CONT.
HV	4	HAMAMELIS VIRGINIANA	WITCH HAZEL	2-3' HT	#5 CONT.
MP	8	MYRICA PENSYLVANICA	NORTHERN BAY BERRY	2-3' HT	#3 CONT.
ST	21	SPIREA ALBA VAR. LATIFOLIA	MEADOW SWEET	18-24" HT	#2 CONT
VC	6	VACCINIUM CORYMBOSUM	BLUEBERRY - HIGHBUSH	2-3' HT	#3 CONT.
VP	5	VIBURNUM PRUNIFOLIUM	BLACK HAW VIBURNUM	3-4' HT	#5 CONT.
VR	10	VIBURNUM RECOGNITUM	NORTHERN ARROWWOOD	2-3' HT	#3 CONT.

WQC/ACOE PLANS SHEET 17 OF 23

A00840-238

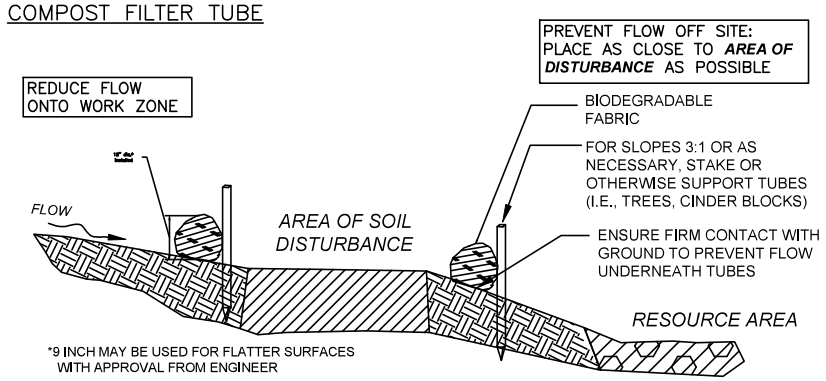
Proposal No. 608929-123406

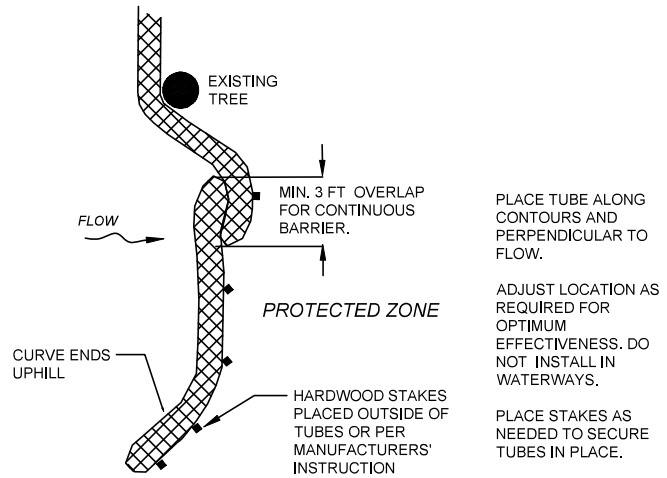
608929_LD01 (LANDSCAPE DETAILS).DWG Plotted on 16-Dec-2022 3:27 PM

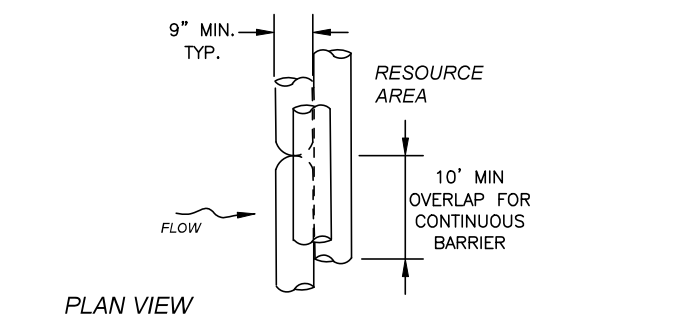


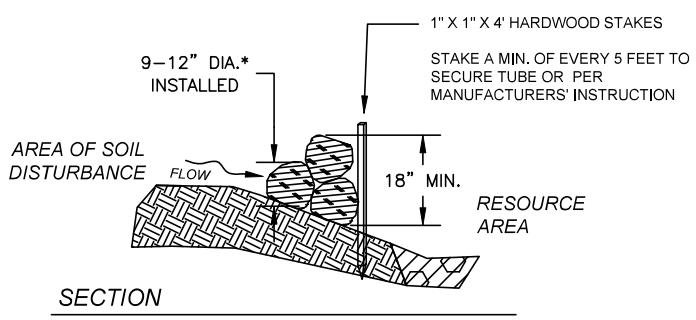
COIR FIBER ROLL

NOT TO SCALE



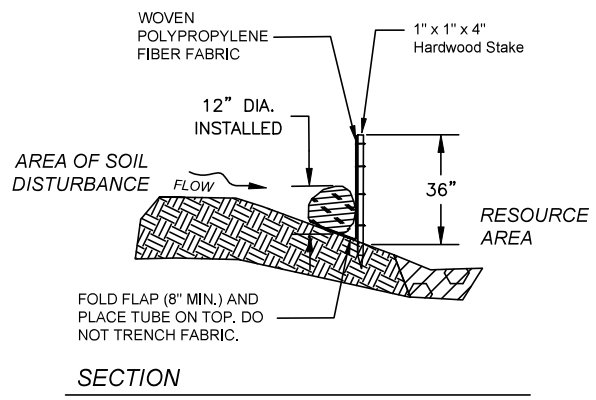






COMPOST FILTER TUBE BERM (SLOPES 2:1 OR STEEPER)

NOT TO SCALE

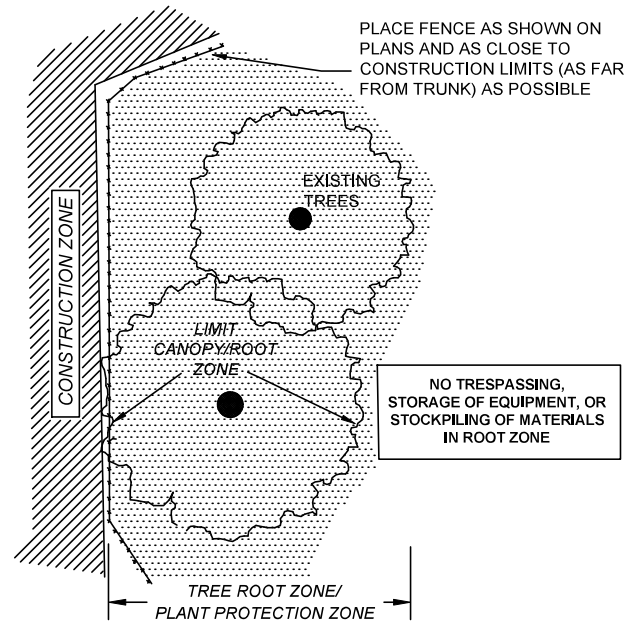


COMPOST FILTER TUBE & SILT FENCE

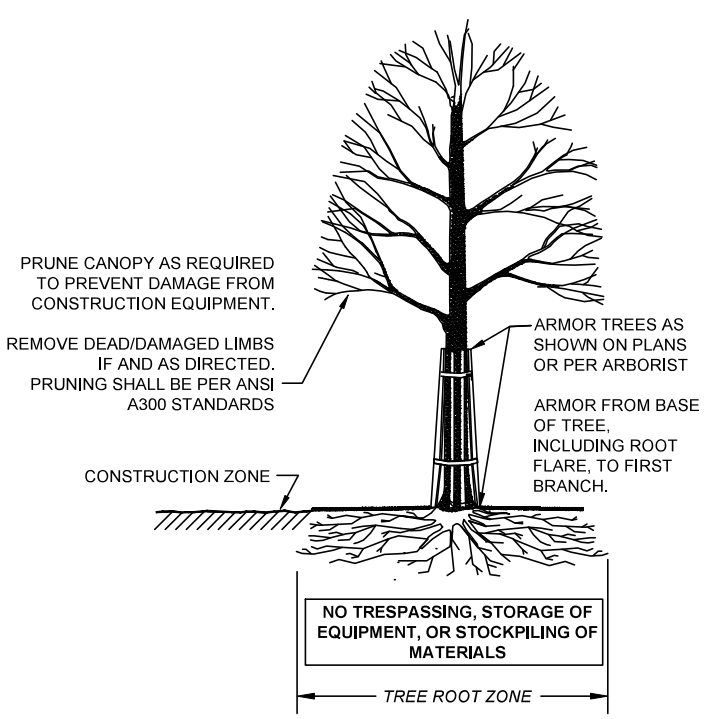
NOT TO SCALE

1 SEDIMENT CONTROL BARRIERS - COMPOST FILTER TUBE & COIR FIBER ROLL

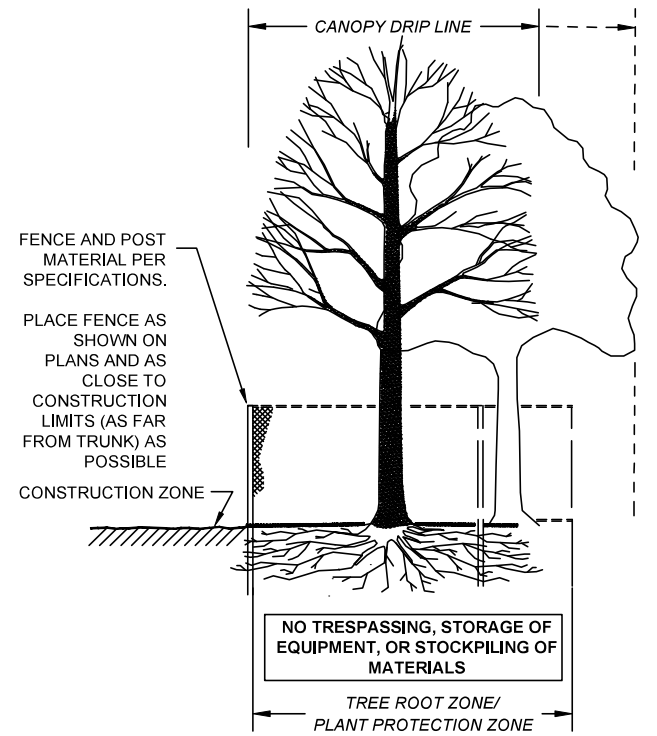
NOT TO SCALE



PLAN VIEW - FENCE PROTECTION OF ROOT ZONE



SECTION - TRUNK ARMORING & PRUNING



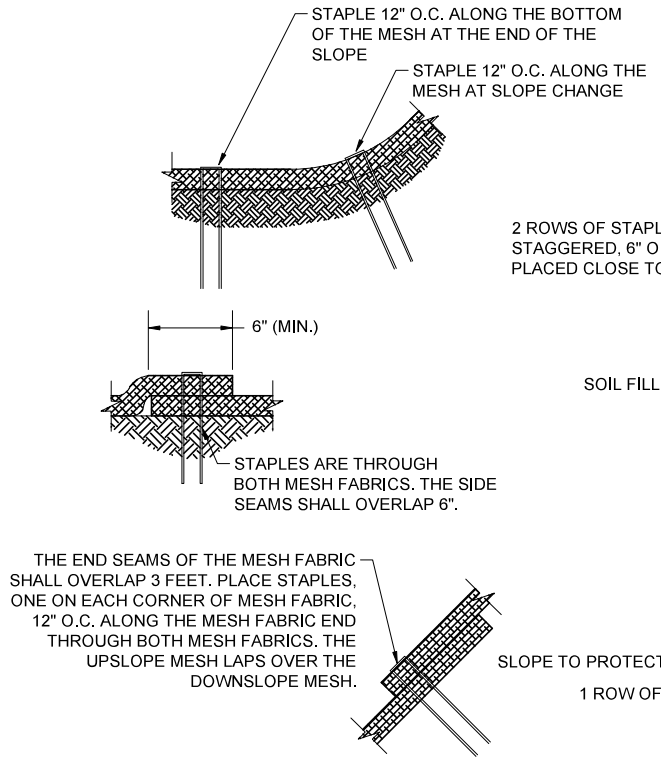
SECTION - FENCE PROTECTION OF ROOT ZONE

2 TREE PROTECTION

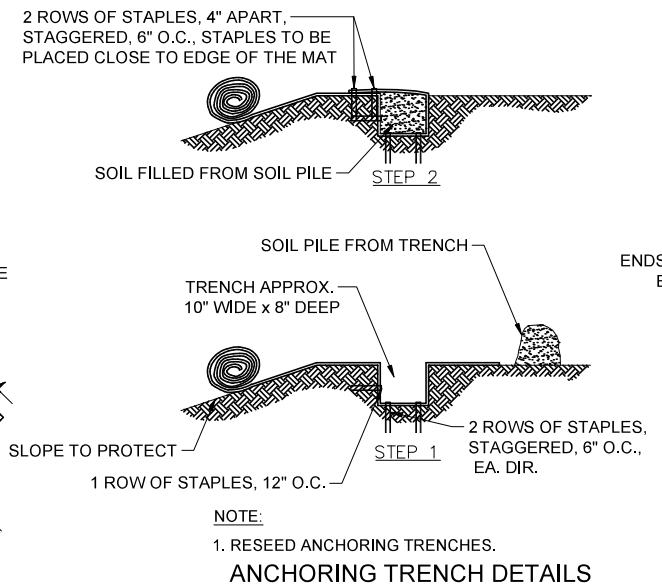
NOT TO SCALE

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	33	105
PROJECT FILE NO.	608929		

LANDSCAPING DETAILS - 2

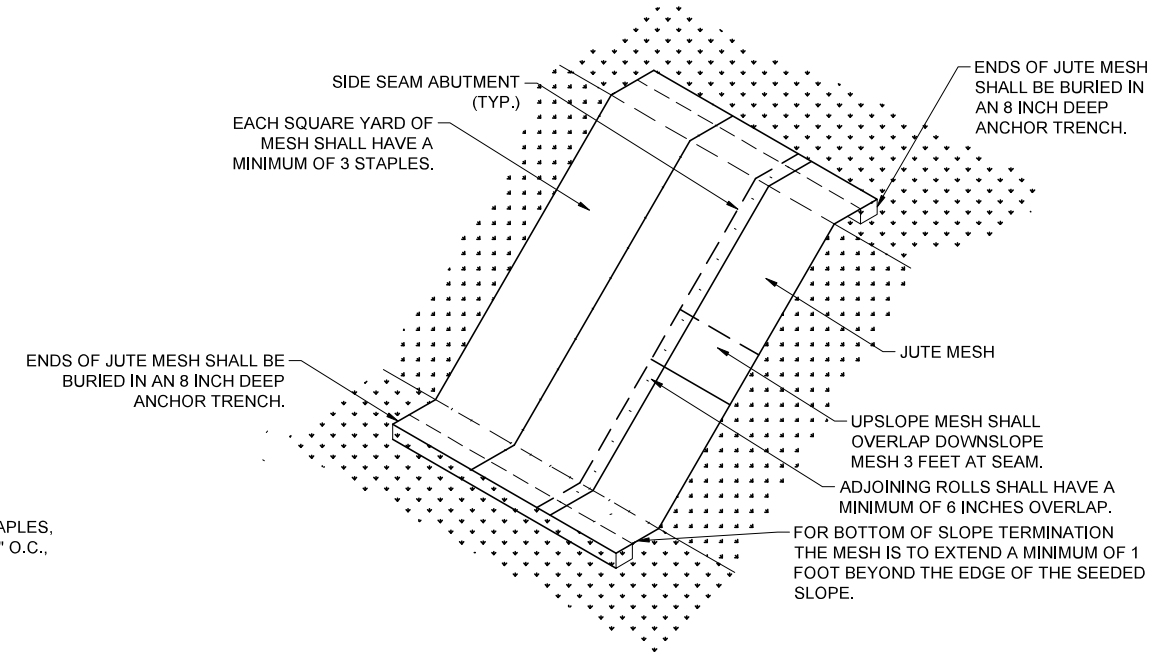


STAPLING DETAILS



NOTE:
1. RESEED ANCHORING TRENCHES.

ANCHORING TRENCH DETAILS

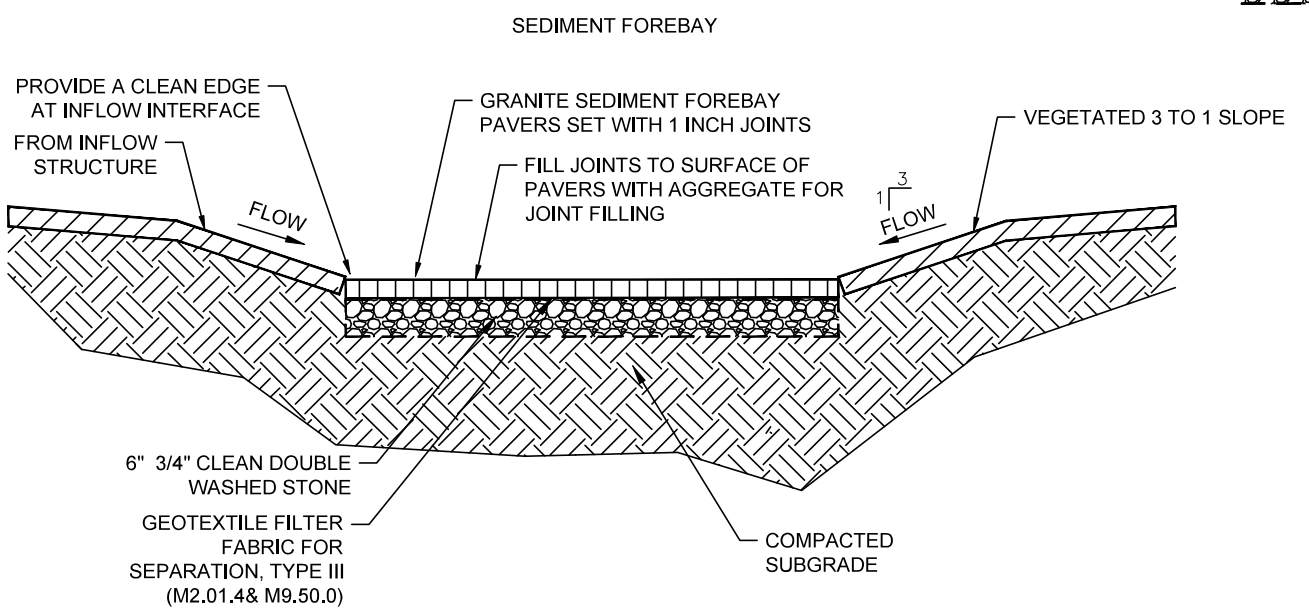


JUTE MESH FABRIC ON SLOPE

NOTES:
1. SEE MANUFACTURER'S STAPLE PATTERN GUIDE FOR DETAILS.
2. INSTALL JUTE MESH ON SLOPES GREATER THAN 3 FEET HORIZONTAL TO 1 FOOT VERTICAL AND WHERE ADDED STABILIZATION FOR EROSION CONTROL IS NEEDED.
3. JUTE MESH SHALL BE INSTALLED WITH CONTINUOUS CONTACT WITH THE SOIL.
4. AREAS WITH JUTE MESH SHALL BE SEEDED PRIOR TO THE INSTALLATION OF THE JUTE MESH.
5. STAPLES SHALL BE DRIVEN IN UNTIL THEIR TOPS ARE FLUSH WITH THE SOIL.
6. STAPLES SHALL BE 11 GAUGE STEEL 6 OR 9 INCHES IN LENGTH. IN AREAS THAT WILL BE MOWN FREQUENTLY EIGHT INCH WOOD STAKES SHALL BE USED TO ANCHOR MESH.
7. JUTE MESH SHALL BE BIODEGRADABLE.

1 JUTE MESH

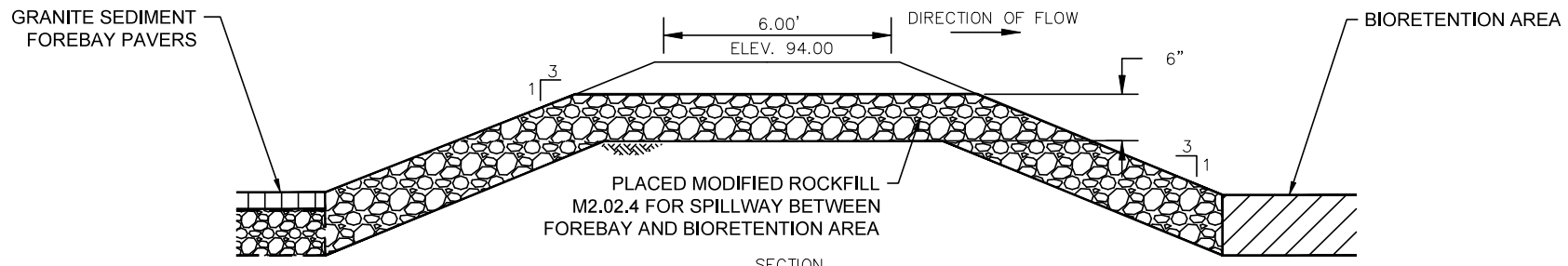
NOT TO SCALE



NOTES:
1. SEE SPECIFICATIONS FOR SEDIMENT FOREBAY PAVER REQUIREMENTS.
2. SEE DRAINAGE AND UTILITY PLANS FOR DIMENSIONS GRADING AND ELEVATIONS FOR SEDIMENT FOREBAY

2 SEDIMENT FOREBAY PAVERS

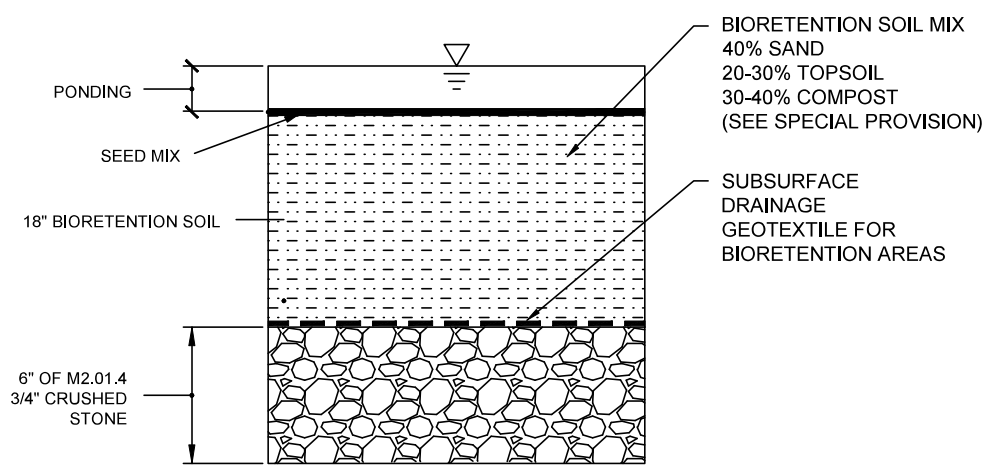
NOT TO SCALE



SECTION

3 SPILLWAY

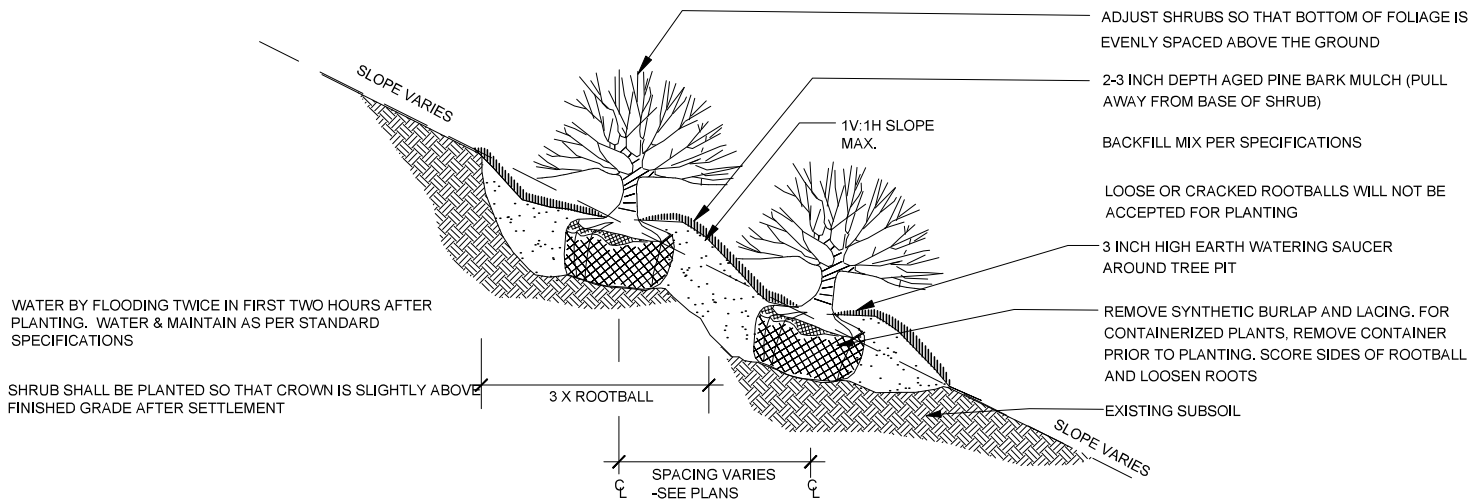
NOT TO SCALE



BIORETENTION AREA SECTION (TYP)

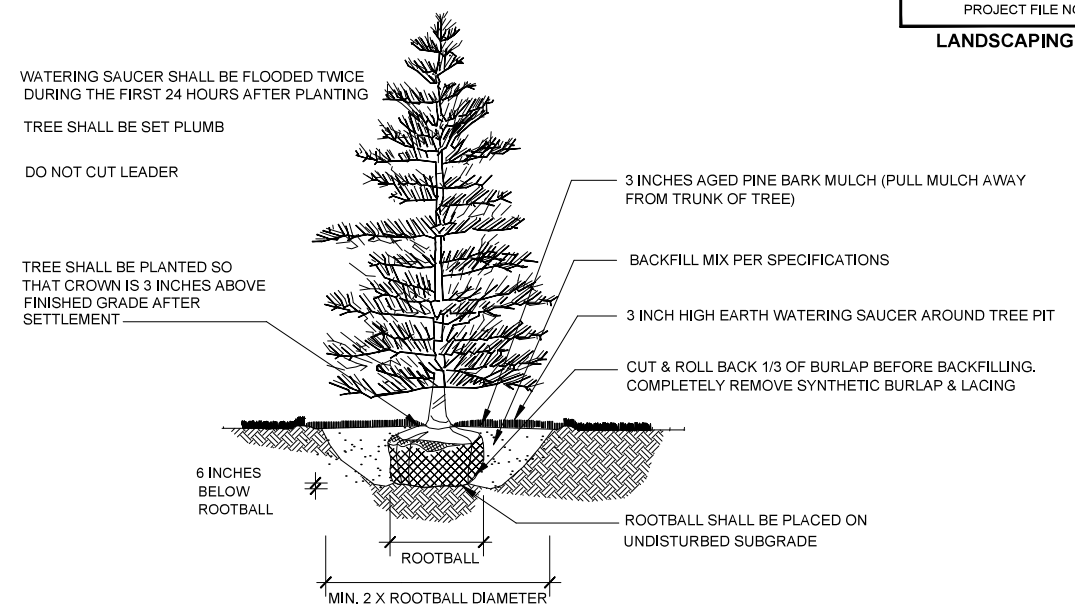
4 BIORETENTION AREA

NOT TO SCALE



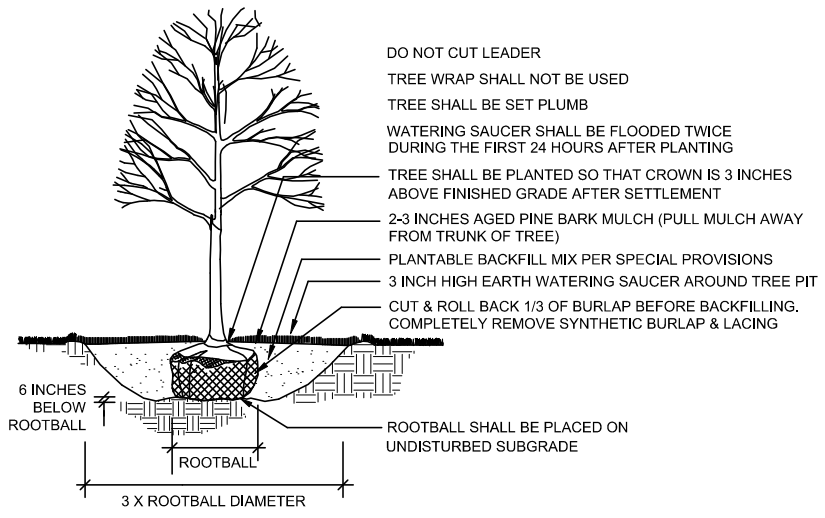
1 CONTAINERIZED SHRUB PLANTING (SLOPE) DETAIL

NOT TO SCALE



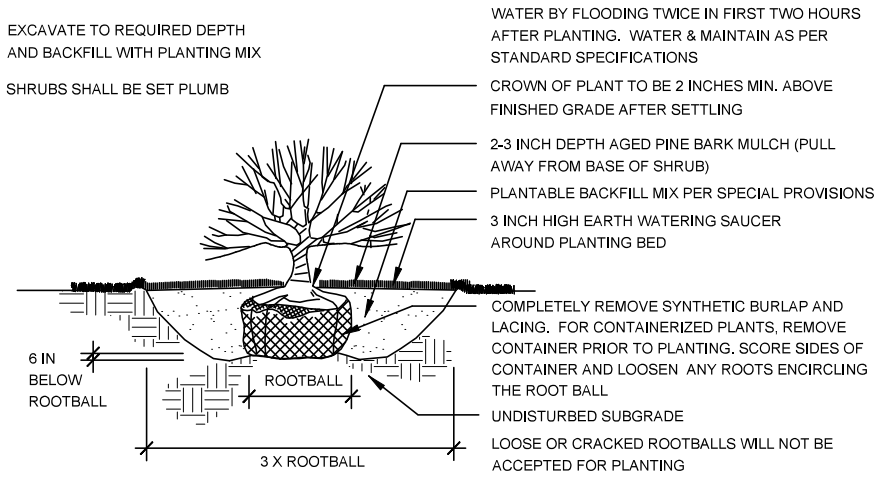
2 EVERGREEN TREE PLANTING

NOT TO SCALE



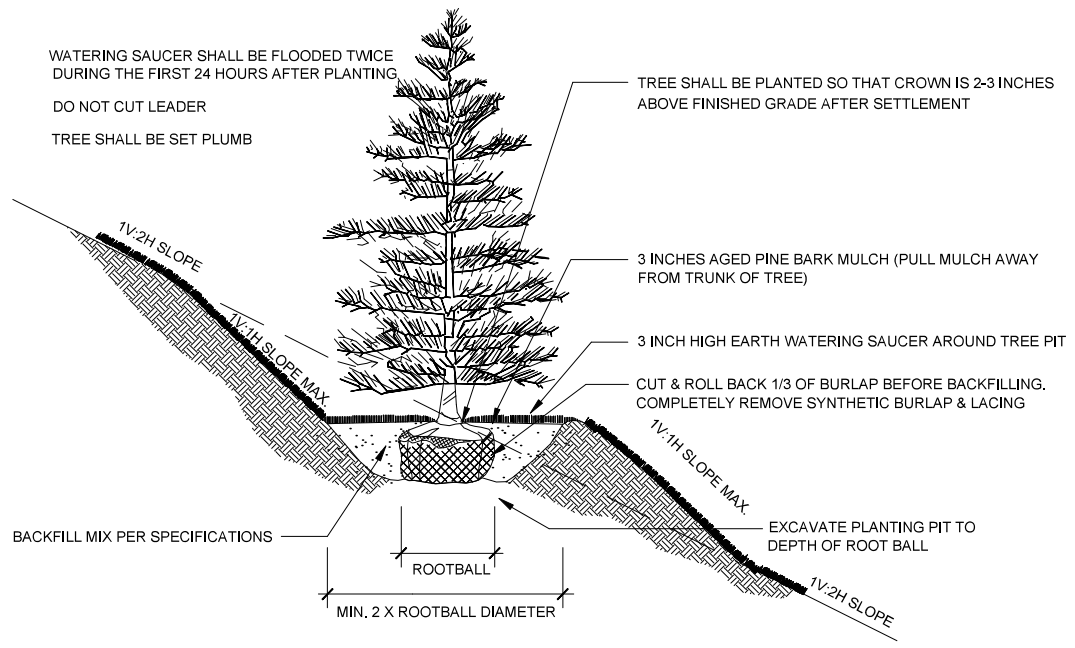
3 TREE PLANTING

NOT TO SCALE



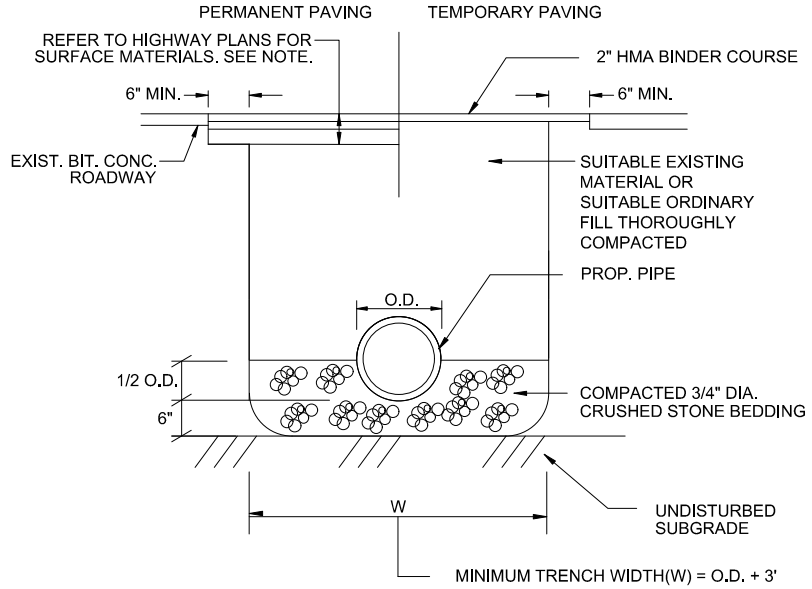
4 SHRUB PLANTING

NOT TO SCALE



5 EVERGREEN TREE PLANTING (SLOPE)

NOT TO SCALE

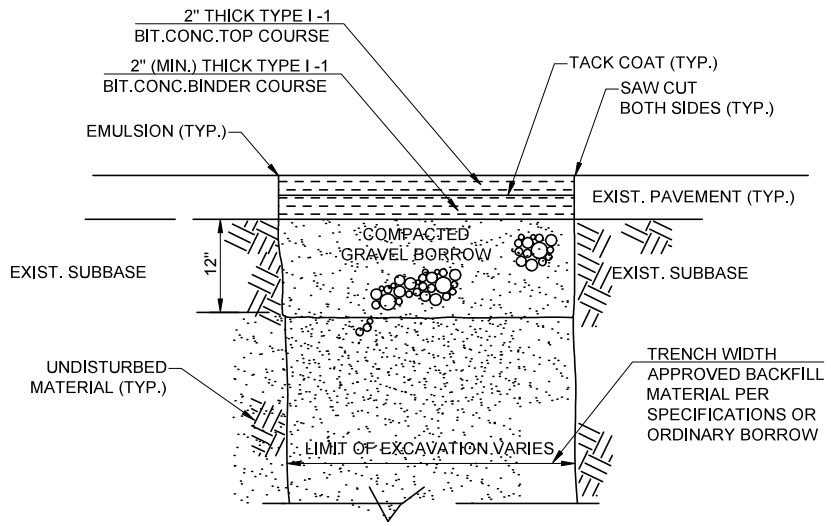


TYPICAL PIPE TRENCH

NOT TO SCALE

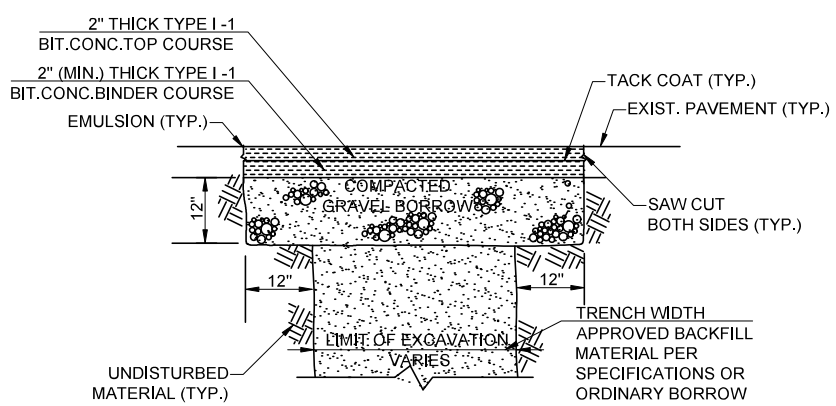
NOTE:

1. PERMANENT PAVING TO BE USED IN ALL AREAS OF MILL AND OVERLAY. MATERIALS SHALL MATCH CORRESPONDING FULL DEPTH SECTION. REFER TO TYPICAL ROADWAY SECTIONS.
2. HMA FOR PATCHING TO BE USED IN AREAS OF FUTURE FULL DEPTH CONSTRUCTION.



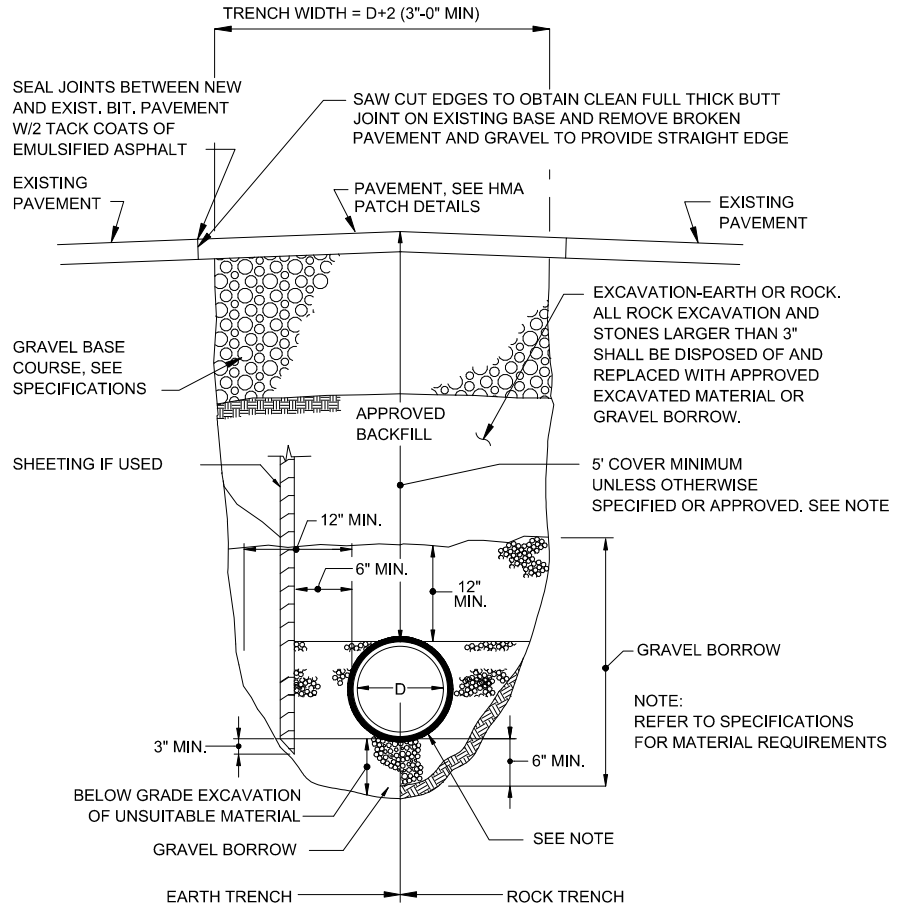
TEMPORARY TRENCH PATCH DETAIL

NOT TO SCALE



PERMANENT TRENCH PATCH DETAIL

NOT TO SCALE



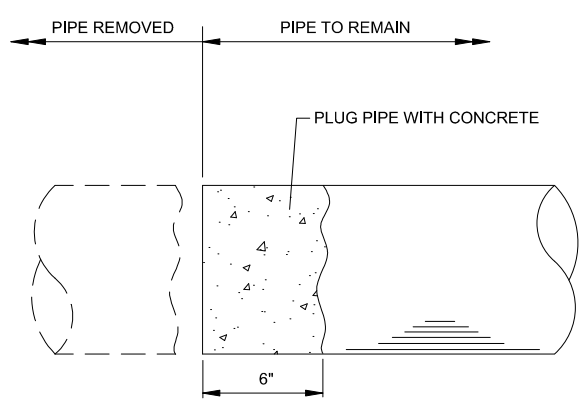
NOTE: FURNISH AND INSTALL CLOSED CELL GLASS INSULATION, 2" THICK FOAMGLASS ONE BY PITTSBURG CORNING OR EQUAL, WITH PITTWRAPP AA JACKETING BY PITTSBURG CORNING OR EQUAL WHEN WATER MAIN CANNOT BE INSTALLED AT OR BELOW THE REQUIRED BURIAL DEPTH OF FIVE (5) FEET BELOW GRADE.

WATER TRENCH SECTION

NOT TO SCALE

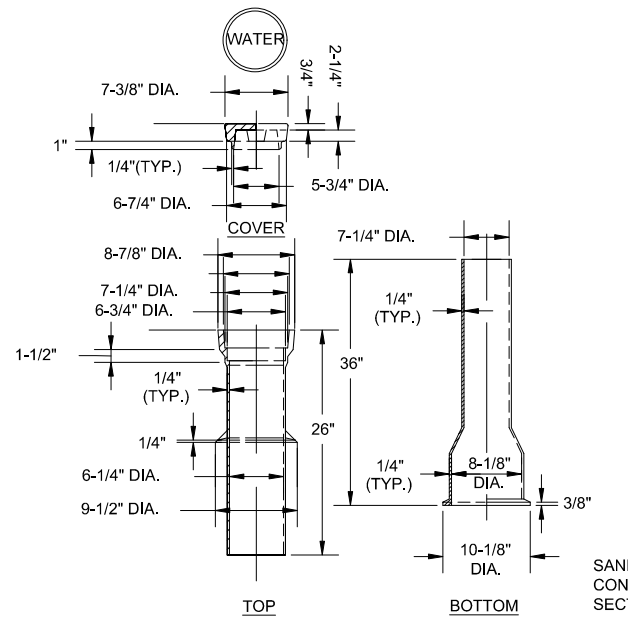
NOTES:

1. THICKNESS OF PAVEMENT SHALL MEET THICKNESS OF EXISTING PAVEMENT BUT IN NO CASE LESS THAN 4".
2. THE CONTRACTOR SHALL MAINTAIN TEMPORARY PAVEMENT FOR A MINIMUM OF 90 DAYS EXCEPT IF TEMPORARY PAVEMENT IS PLACED AFTER OCTOBER 1ST, THEN IT SHALL BE MAINTAINED UNTIL APRIL 15 OF THE FOLLOWING YEAR.
3. CONTRACTOR SHALL MEET EXISTING ROADWAY GRADES.
4. THE CONTRACTOR IS ADVISED THAT THE USE OF READY-MIX FLOWABLE FILL MAY BE REQUIRED BY THE CITY OF CAMBRIDGE DPW OR WATER DEPARTMENT FOR TRENCH BACKFILLING AND PATCHING IN THE STREET. READY-MIX FLOWABLE FILL SHALL BE USED AS DIRECTED BY THE CITY OF CAMBRIDGE AND SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.



TYPICAL PIPE PLUGGING DETAIL

NOT TO SCALE

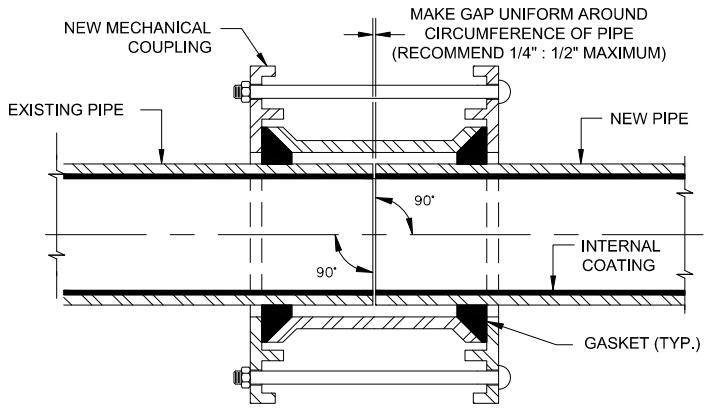


SAND BORROW MEETING CWD CONSTRUCTION STANDARDS SECTION 3.05 AND 3.06

1. ALL VALVES SHALL BE PROVIDED WITH STANDARD VALVE BOXES AND COVERS OF THE SLIDING TYPE.
2. DUCTILE IRON MAY BE SUBSTITUTED FOR CAST IRON VALVE BOXES.
3. MECHANICAL JOINTS, AFTER PIPE GASKETS AND FOLLOWER GLAND HAVE BEEN ASSEMBLED ACCORDING TO THE MANUFACTURERS INSTRUCTIONS, SHALL HAVE BOLTS INSERTED AND TIGHTENED BY HAND UNTIL ALL ARE EVEN. A RATCHET WRENCH IS THEN USED TO COMPLETE TIGHTENING OF THE BOLTS AND NUTS WITH CARE BEING TAKEN TO TIGHTEN THE OPPOSITE NUTS SO AS TO KEEP GLAND SQUARE WITH SOCKET AND BOLT STRESS EVENLY DISTRIBUTED.
4. VALVES SHALL OPEN LEFT AS PER THE WATER DEPARTMENT OF TOWN OF WILMINGTON MA RULES AND REGULATIONS.

STANDARD VALVE BOX AND COVER

NOT TO SCALE



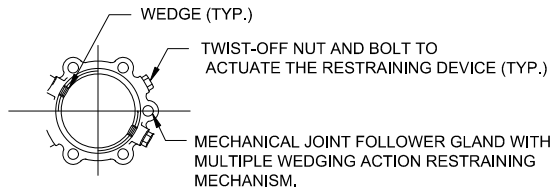
MECHANICAL COUPLING (NON-INSULATING)

NOTES:

1. CONTRACTOR TO VERIFY OUTSIDE DIAMETER OF ALL EXISTING AND PROPOSED PIPES FOR SIZING COUPLINGS.
2. TRANSITION COUPLINGS WITH LARGER GASKETS OR REDUCING MIDDLE RINGS AS REQUIRED BY MANUFACTURER TO SPAN PIPES WITH DIFFERENT SIZE OUTSIDE DIAMETERS. A REDUCING MIDDLE RING SHALL BE USED AT LOCATIONS WHERE OUTSIDE DIAMETERS DIFFER BY 1-INCH OR MORE.
3. MECHANICAL COUPLINGS AND ALL HARDWARE SHALL BE COMPLETELY WRAPPED WITH WAX-TAPE COATING SYSTEM.
4. MECHANICAL COUPLINGS AND ALL HARDWARE SHALL BE INSTALLED AND TESTED AS PER MANUFACTURER'S STANDARDS AND INSTALLATION GUIDELINES.

MECHANICAL COUPLINGS

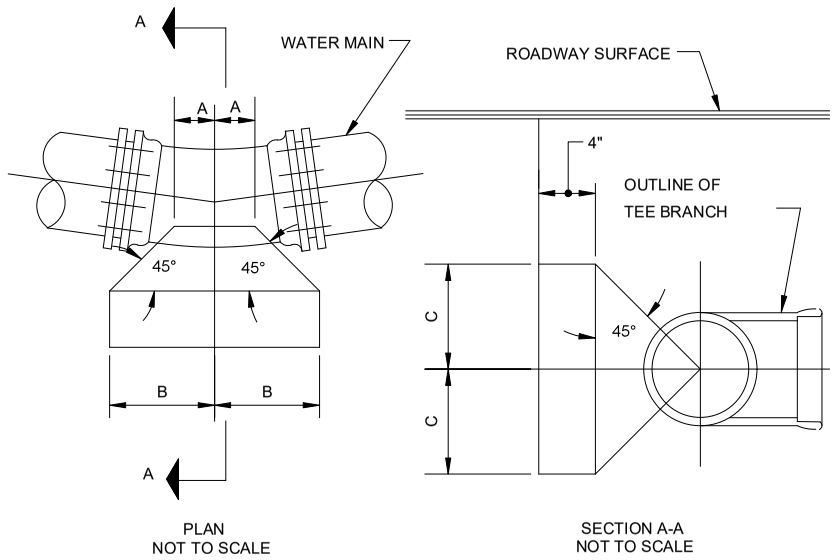
NOT TO SCALE



NOTES:

1. GLANDS SHALL BE DUCTILE IRON CONFORMING TO A.S.T.M. A 536-80 STEEL.
2. DIMENSIONS OF THE GLAND SHALL BE SUCH THAT IT CAN BE USED WITH THE STANDARDIZED MECHANICAL JOINT BELL AND TEE-HEAD BOLTS CONFORMING TO A.N.S.I./A.W.W.A. A 21.11 AND A.N.S.I./A.W.W.A. C 153/A 21.53 OF LATEST REVISION.
3. LENGTH OF RESTRAINED PIPE SHALL BE IN ACCORDANCE WITH "THRUST RESTRAINT DESIGN FOR DUCTILE IRON PIPE" AS PUBLISHED BY THE DUCTILE IRON PIPE RESEARCH ASSOCIATION (DIPRA).

MECHANICAL JOINT RESTRAINT
NOT TO SCALE



PLAN
NOT TO SCALE

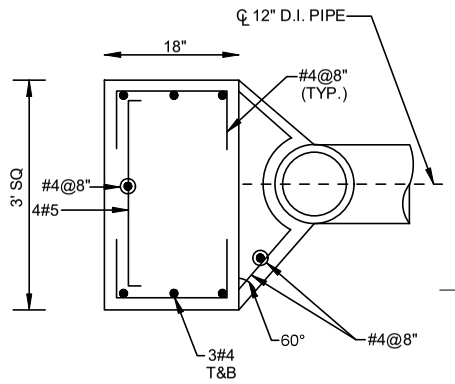
SECTION A-A
NOT TO SCALE

HORIZONTAL THRUST BLOCK SCHEDULE
TABLE OF DIMENSIONS IN INCHES

		A	B	C
6", 8" BEND				
	11 1/4°, 22 1/2°	6"	10"	10"
	45°	6"	14"	14"
	90°	9"	19"	19"
10", 12" BEND				
	11 1/4°, 22 1/2°	6"	14"	14"
	45°	6"	20"	20"
	90°	9"	27"	27"
	TEE (BRANCH)/CAP			
	6"	6"	15"	15"
	8"	9"	16"	16"
	10"	9"	19"	19"
	12"	9"	23"	23"

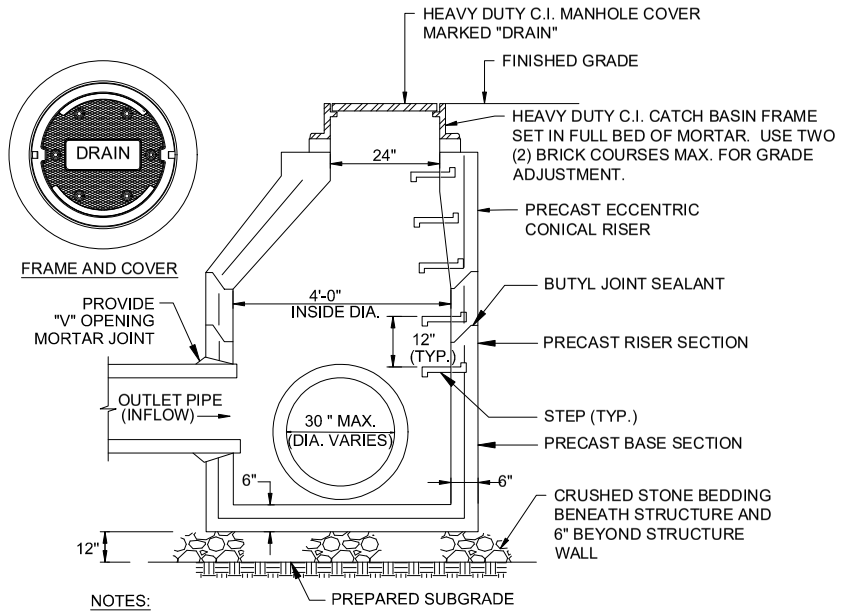
NOTE : REFER TO SPECIFICATIONS FOR MATERIAL REQUIREMENTS

SUBJECT TO FIELD MODIFICATION BY ENGINEER



45° BEND THRUST BLOCK REINFORCEMENT
NOT TO SCALE

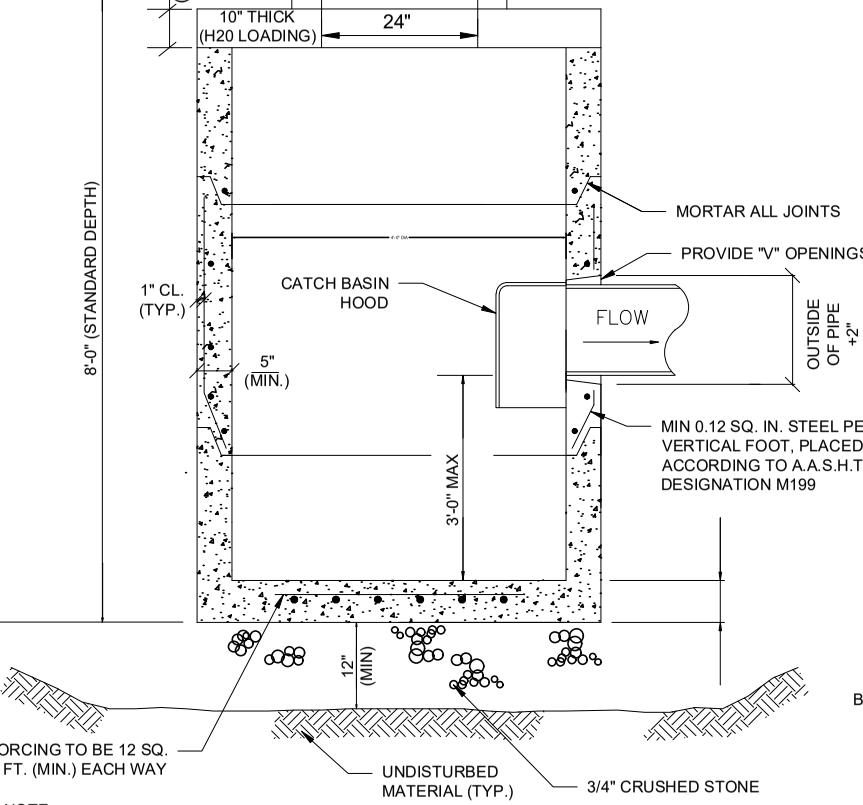
THRUST BLOCK DETAIL
NOT TO SCALE



NOTES:

1. PRECAST CONCRETE SECTIONS SHALL CONFORM TO ASTM C-478
2. STEEL REINFORCING SHALL CONFORM TO ASTM A185
3. MANHOLE STEPS SHALL BE 14" WIDE STEEL REINFORCED COPOLYMER POLYPROPYLENE PLASTIC AND SHALL BE CAST INTO MANHOLE SECTIONS BY THE PRECAST MANHOLE MANUFACTURER.

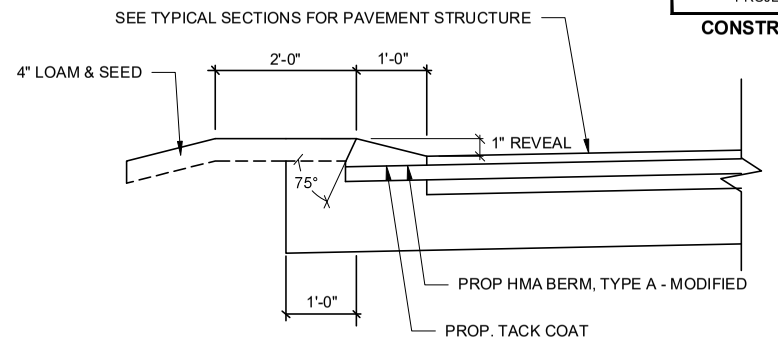
TYPICAL DRAIN MANHOLE DETAIL
NOT TO SCALE



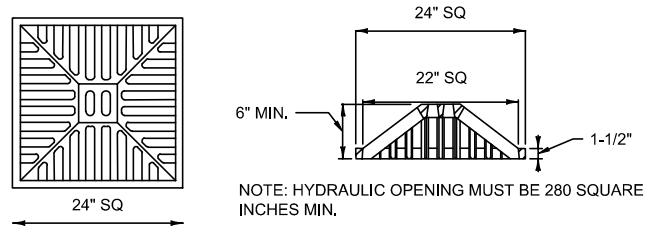
NOTE:

4" HEAVY DUTY FRAME AND GRATE TO BE USED FOR FLAT TOP DRAINAGE STRUCTURES WHERE DISTANCE BETWEEN TOP OF PIPE AND GROUND IS 2 FEET OR LESS.

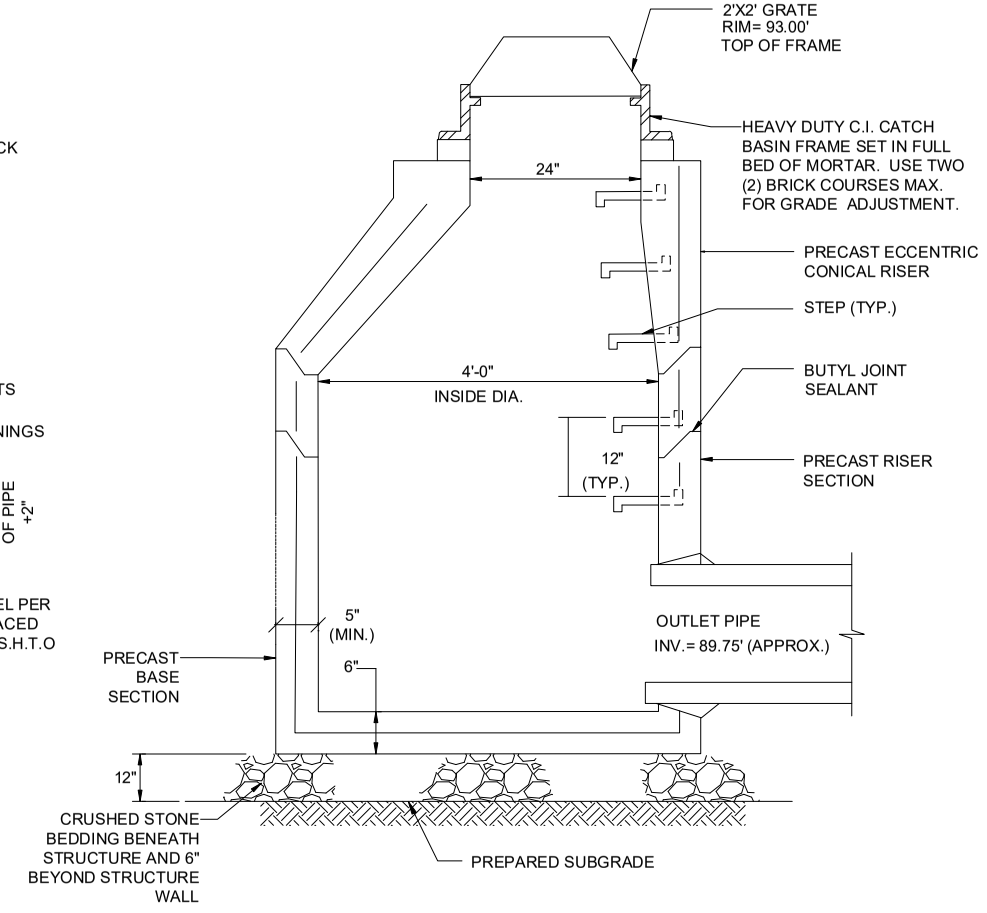
TYPICAL FLAT TOP SLAB CATCH BASIN DETAIL
NOT TO SCALE



HMA BERM, TYPE A - MODIFIED
NOT TO SCALE



NOTE: HYDRAULIC OPENING MUST BE 280 SQUARE INCHES MIN.



NOTES:

1. PRECAST CONCRETE SECTIONS SHALL CONFORM TO ASTM C-478
2. STEEL REINFORCING SHALL CONFORM TO ASTM A185
3. MANHOLE STEPS SHALL BE 14" WIDE STEEL REINFORCED COPOLYMER POLYPROPYLENE PLASTIC AND SHALL BE CAST INTO MANHOLE SECTIONS BY THE PRECAST MANHOLE MANUFACTURER.

OUTLET CONTROL STRUCTURE
NOT TO SCALE

WILMINGTON
BUTTERS ROW OVER MBTA

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	37	105
PROJECT FILE NO.	608929		

WETLAND REPLICATION PLAN

LEGEND

- LIMIT OF WORK
- COMPOST FILTER TUBE
- COIR FIBER ROLL
- 595 PROPOSED CONTOUR
- 595 EXISTING CONTOUR
- 124.694 PROPOSED SPOT GRADE
- 124.694 EXISTING SPOT GRADE
- COMPOST BLANKET & NATIVE UPLAND SEED MIX
- WETLAND SOIL AND SEED MIX

WETLAND SOIL AND SEED MIX = 300 S.F.

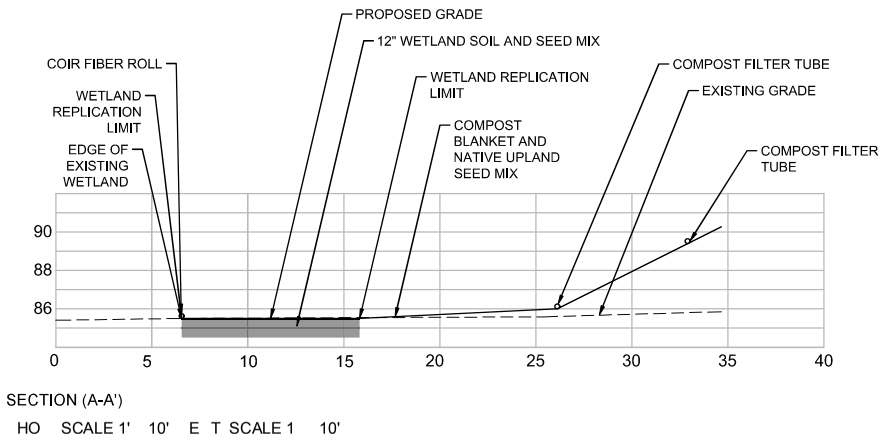
COMPOST BLANKET & NATIVE UPLAND SEED MIX (ON FLAT AREA ABOVE REPLICATION AREA) = 518 S.F.

COMPOST FILTER TUBE = 223 L.F.

COIR FIBER ROLL = 101 L.F.

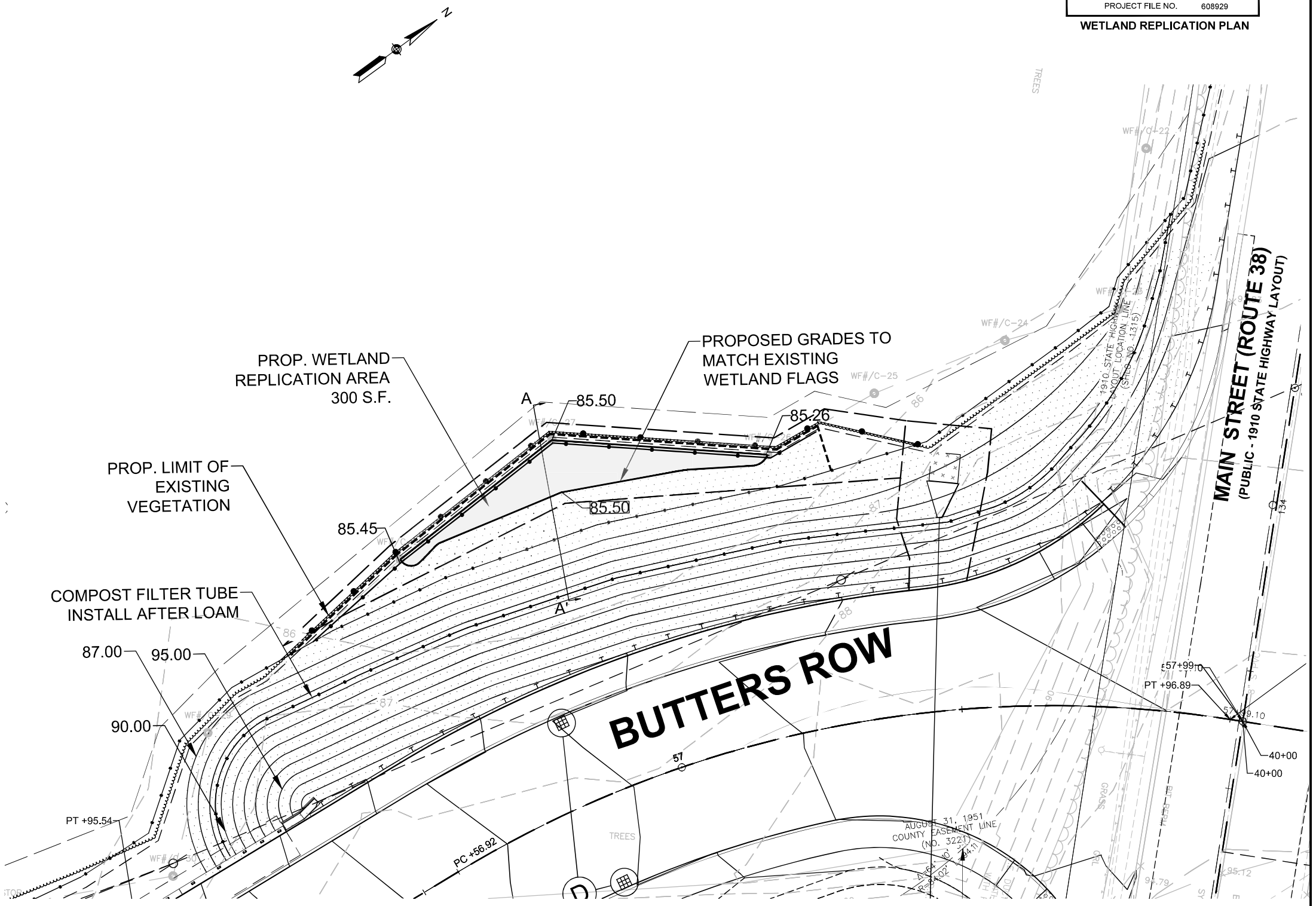
NOTES:

1. FINAL GRADES TO BE SET APPROXIMATELY 6-12 INCHES ABOVE GROUNDWATER ELEVATION. MINOR ADJUSTMENTS IN FINAL GRADES SHALL BE MADE IN THE FIELD BY THE WETLAND SPECIALIST.
2. REPLICATION AREA SHALL BE EXCAVATED TO A DEPTH BETWEEN TWELVE (12) AND EIGHTEEN (18) INCHES BELOW THE FINAL DESIGN ELEVATIONS. THE SALVAGED TOPSOIL MATERIAL AND B-HORIZON SUBSOIL MATERIAL EXCAVATED FROM THE WETLAND IMPACT AREAS SHALL BE PLACED IN SEPARATE STOCKPILES TO BE REUSED IN THE PROPOSED REPLICATION AREA IF SUITABLE.
3. REPLICATION AREA GRADING SHOULD MATCH THE ELEVATIONS OF THE ABUTTING WETLAND TO MAINTAIN A HYDROLOGIC CONNECTION. WETLAND SPECIALIST SHALL INSPECT THE SUB-GRADE OF THE REPLICATION AREA TO ENSURE THAT THE PROPER HYDROLOGY HAS BEEN ESTABLISHED. MINOR MODIFICATIONS TO THIS GRADING PLAN MAY BE MADE IN THE FIELD BY THE QUALIFIED WETLAND SPECIALIST IN RESPONSE TO SUBSURFACE HYDROLOGIC CONDITIONS.



SECTION (A-A')

HO SCALE 1' 10' E T SCALE 1 10'



10 0 10 20

SCALE IN FEET

1" = 20'

WQC/ACOE PLANS SHEET 23 OF 23

A00840 -244

608929_EV (P-REPLICATION).DWG Plotted on 16-Dec-2022 3:28 PM

Proposal No. 608929-123406

May 10, 2023

To:	Heidi Davis, MassDEP (heidi.davis@state.ma.us) Tyler Lewis, MassDEP (Tyler.Lewis@mass.gov)
Cc:	Melissa Lenker, MassDOT (melissa.lenker@state.ma.us) Cori Beckwith, MassDOT (corinna.beckwith2@state.ma.us)
From:	Danielle Spicer, P.E., Green International Affiliates, Inc.
Date:	May 10, 2023
Project Name:	Bridge Replacement (W-38-003) Butters Row over MBTA Wilmington, MA MassDOT Project 608929
Project Number:	Green No. 21058.XX
Subject:	**Response to MassDEP Administrative Completeness and Technical Deficiency Letter for 401 WQC Application No: 23-WW11-0002-APP**

This memorandum provides the additional details in response to DEP's Administrative Completeness and Technical Deficiency email dated 4/19/2023 for 401 WQC Application No: 23-WW11-0002-APP.

For reference, the history of the communication of the subject matter between MassDOT Environmental and MassDEP is provided below with our responses noted in **BOLD**:

1. On April 12, 2023 MassDOT Environmental responded to the original Administrative Completeness and Technical Deficiency letter, dated April 7, 2023, with regards the suggestion to further reduce the project limits by removing one of the sidewalks along Butters Row within the project limits with the following details:

   The project's main purpose is to provide a safe and improved crossing of Butters Row over the MBTA tracks, which is currently structurally deficient and functionally obsolete, as well as to improve the multimodal accommodations along the project corridor. Another upcoming MassDOT Project No. 608051 (Reconstruction on Route 38), incorporates elements of "Complete Streets" along Route 38 and its major intersections, which includes the intersection of Route 38 and Butters Row subject to this WQC Application. The side street approaches at this intersection are proposed to be realigned to provide improved sight distances and geometry, which are currently causing safety concerns for all roadway users. Both projects are intended to incorporate the "Complete Streets" elements to improve pedestrian and bicyclists' safety, connectivity with pedestrian and bicycle accommodations proposed as part of the adjacent Route 38 project, as well as to improve site visibility.

   Therefore, in order to enhance the overall safety along both Butters Row and Route 38 for all roadway users including bicyclists, pedestrians, and vehicles, the proposed design requires providing two sidewalks on both sides of Butters Row. Impacts to adjacent resource areas were minimized to the maximum extent practical by the proposed

retaining wall on the north side of Butters Row and stormwater is mitigated with a proposed bioretention basin for the eastern portion of the project.

2. On April 19, 2023, MassDOT Environmental received the additional response from MassDEP with the following details:

   Thank you for your response of April 12th and the reference to MassDOT's Complete Streets Program. We understand that the project's main purpose is to provide and safe and improved crossing of Butters Row over the MBTA tracks. MassDEP also acknowledges that this project qualifies as a redevelopment project. As described in the application, the entire project is within a Zone II; Standard 6 of the stormwater standards requires that any project discharging to a Zone II area shall receive the highest and best practical method of treatment. Given that the proposed project will increase impervious area by approximately 61 percent and will have a TSS removal rate of approximately 40 percent, the project, as proposed, does not appear to do provide the appropriate level of treatment.

   Our request to evaluate a single-sidewalk alternative was intended to guide the project towards decreasing impervious areas so as to better meet the MEP standard. If this alternative is not possible, then an evaluation of possible locations for Stormwater Control Measures (SCMs) and Low Impact Development (LID) techniques must include sufficient detail to determine why each SCM or LID technique was not feasible or practicable at each location. This includes an evaluation of subsurface measures and off-site mitigation, as applicable, to be a complete evaluation.

   In addition, there is a discrepancy in the stated increase in impervious area. The narrative notes that impervious area will increase by 23,109 square feet while Table 9 indicates that there will be 30,202 square feet. Also, there appears to be a discrepancy within Table 9, as well, as the totals for existing and proposed impervious area are the same, and the net impervious numbers do not add up to the total. These numbers should be clarified and water quality data adjusted accordingly.

In response the above concerns expressed by DEP, the following additional evaluation details are provided below:

The proposed project will result in a net increase of 20,202 SF. This number is correctly noted in all the calculations, but was incorrectly noted in the narrative and Table 9. We have updated both the narrative and Table 9 and included an updated PDF of the report to reflect this.

The project will treat 17,703 SF of impervious area within the proposed BMP, which is approximately 88% of the net increase of impervious area. Removal of one side of the sidewalk accounts for a range of 4,150 – 4,350 SF (use 4,250 SF for average) depending on which side is removed. The proposed BMP is treating approximately 55% of both sides of the sidewalk. Removal of one side of the sidewalk would only result in a reduction of approximately 1,900 SF of non-treated impervious area from the project. This amount is very minimal and the public safety improvements and benefits of providing a sidewalk on both sides of the roadway outweigh removing one side of the sidewalk.

Other locations within the project limits were reviewed for additional stormwater treatment and are summarized below:

- **West of the bridge, there are steep slopes immediately adjacent to both sides of Butters Row that extend down to the ROW limits preventing installation of stormwater BMPs. In addition, there is a gravel access road to the MBTA railroad that is located between Butters Row and the large wetland system to the north that needs to be maintained.**
- **Consideration was also given to installing stormwater mitigation BMPs west of the bridge along the south side of Butters Row; however, there is a two-story house located just west of the intermittent stream and the steep slopes in this area prevent installation of a stormwater BMP.**
- **There is a small upland area near the vegetated wetland C-series west of the bridge across from Butters Row/Factory Road intersection. This area was considered for stormwater mitigation; however, construction of a stormwater BMPs at this area was not found practicable because this area has multiple mature trees (see *Photo 1* below), which serve as a natural buffer to the adjacent wetland. Removal of these mature trees so close to the wetland system could result in negative impacts to it. In addition, the area is likely to have a high groundwater table, since it is immediately adjacent to the wetland area C-series with standing water surrounding the intermittent stream (see *Photo 2* below). The proposed drainage that discharges in this area includes catch basins with deep sumps and hoods and will provide a min. of 25% TSS removal. In addition, runoff over this vegetated area with mature tress will provide some treatment as well. Therefore, the removal of these mature trees and disturbance to this area in order to install a small stormwater BMP was not found as a practical alternative.**

Photo 1: *View looking north from the Butters Row/Factory Road intersection*

Photo 2: *View of Vegetated Wetland C-series at the location of the intermittent stream (inlet)*

In addition, 400-feet of approach retaining walls were added to the project to minimize environmental impacts on the project.

To conclude, the additional sidewalk is providing necessary safety improvements and overall public benefit, and its removal is not practical with regards to the small amount of impervious area to be reduced by its removal, as demonstrated above. Multiple areas throughout the project site were considered; however, given the constraints noted above, were deemed either impracticable or infeasible. The project, as a whole, is providing stormwater mitigation to the maximum extent practicable.